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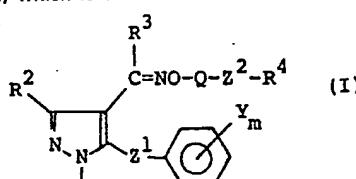
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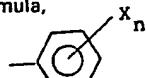
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(54) A pyrazole oxime derivative and its production and use.

(57) A pyrazole oxime derivative represented by the general formula (I) which is useful as an insecticide, miticide and fungicide,

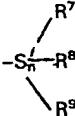


wherein R¹ represents C₁-C₄ alkyl or phenyl; R² represents hydrogen, C₁-C₅ alkyl, C₁-C₃ haloalkyl or phenyl; R³ represents hydrogen, C₁-C₄ alkyl or phenyl; R⁴ represents hydrogen, C₂-C₄ alkylcarbonyl, benzoyl, naphthyl or a substituent of the formula,



[in which X represents hydrogen; halogen; C₁-C₁₂ alkyl; C₁-C₆ alkyl substituted with halogen, cyano, hydroxy, C₁-C₅ alkoxy or C₂-C₆ alkoxy carbonyl; C₃-C₈ cycloalkyl; cycloalkyl substituted with from one to three members selected from the group

consisting of C₁-C₄ alkyl, halogen and cyano; C₂-C₄ alkenyl substituted with halogen, hydroxy, C₂-C₄ alkoxy carbonyl or C₂-C₆ alkyl carbonyl; phenyl; hydroxy; C₁-C₆ alkoxy; C₁-C₄ alkoxy substituted with halogen or C₂-C₆ alkoxy carbonyl; phenoxy which may or may not be substituted with C₁-C₃ haloalkyl benzyl; C₁-C₃ alkylene dioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C₁-C₃ haloalkyl; a substituent of the formula, -S(O)_pR⁵ (in which R⁵ represents C₁-C₆ alkyl, C₁-C₅ haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula -COOR⁶ (in which R⁶ represents hydrogen; alkali metal; C₁-C₁₀ alkyl; C₁-C₆ alkyl substituted with halogen, C₁-C₄ alkoxy, phenoxy, C₂-C₄ alkoxy carbonyl or phenoxyphenyl; C₂-C₇ alkenyl; C₃-C₇ alkynyl; C₃-C₈ cycloalkyl; C₃-C₈ cycloalkyl substituted with C₁-C₃ alkyl; phenyl; or a substituent of the formula,



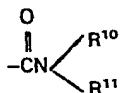
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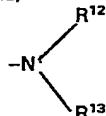
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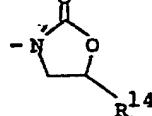
(in which R⁷, R⁸ and R⁹, which may be the same or different, represent C₁-C₄ alkyl or C₃-C₈ cycloalkyl); C₂-C₆ alkylcarbonyl; C₂-C₆ alkylcarbonyl substituted with cyano or C₂-C₆ alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C₁-C₆ alkyl; C₂-C₆ alkylthiocarbonyl; C₃-C₇ represents an integer of 0, 1 or 2), hydroxycarbonyl, C₂-C₅ alkoxy carbonylcarbonyl; a substituent of the formula,



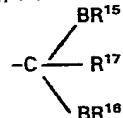
(in which R¹⁰ and R¹¹, which may be the same or different, represent hydrogen, C₁-C₆ alkyl or phenyl); piperidino carbonyl; morpholinocarbonyl which may or may not be substituted with one or two C₁-C₄ alkyls; a substituent of the formula,



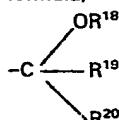
(in which R¹² represents hydrogen or C₁-C₅ alkyl, and R¹³ represents formyl, C₂-C₁₂ alkoxy carbonyl, or C₂-C₆ alkoxy carbonyl substituted with halogen or C₁-C₄ alkoxy); a substituent of the formula,



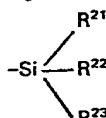
(in which R¹⁴ represents hydrogen, C₁-C₄ alkyl or C₂-C₆ alkoxy alkyl); a substituent of the formula,



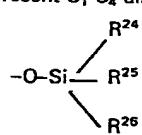
(in which R¹⁵ and R¹⁶, which may be the same or different, represent C₁-C₄ alkyl, or taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxy carbonyl, and B represents oxygen or sulfur); a substituent of the formula,



(in which R¹⁸ represents hydrogen or C₂-C₄ alkylcarbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or C₁-C₆ alkyl); a substituent of the formula,

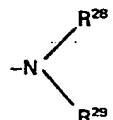


(in which R²¹, R²² and R²³, which may be the same or different, represent C₁-C₄ alkyl); or a substituent of the formula,



(in which R²⁴, R²⁵ and R²⁶, which may be the same or different, represent C₁-C₄ alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C₁-C₆ alkyl,

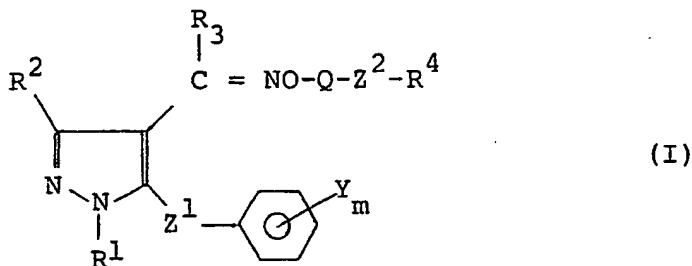
C₁-C₄ haloalkyl, halogen, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalcoxy, C₁-C₃ alkylene dioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, -S(O)_qR²⁷ (in which R²⁷ represents C₁-C₃ alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C₂-C₅ alkoxy carbonylcarbonyl or a substituent of the formula,



(in which R²⁸ and R²⁹, which may be the same or different, represent hydrogen, C₁-C₄ alkyl, or benzyl which may or may not be substituted with C₂-C₆ alkoxy carbonyl); Z¹ represents oxygen or sulfur; Z² represents oxygen, sulfur or single bond; Q represents C₁-C₈ alkylene, C₁-C₈ alkylene substituted with halogen or phenyl, C₃-C₁₂ alkenylene, C₃-C₁₂ haloalkenylene or C₃-C₆ alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different; and the method of controlling said pests by using the same oxime derivative.

A PYRAZOLE OXIME DERIVATIVE AND ITS PRODUCTION AND USE

1 The present invention relates to a pyrazole oxime derivative, its production and an insecticidal and acaricidal composition containing it as an active ingredient for use in agriculture and horticulture, said pyrazole oxime
 5 derivative being represented by the general formula (I),



wherein R^1 represents $\text{C}_1\text{-C}_4$ alkyl or phenyl; R^2 represents hydrogen, $\text{C}_1\text{-C}_5$ alkyl, $\text{C}_1\text{-C}_3$ haloalkyl or phenyl; R^3 represents hydrogen, $\text{C}_1\text{-C}_4$ alkyl or phenyl; R^4 represents hydrogen, $\text{C}_2\text{-C}_4$ alkylcarbonyl, benzoyl, naphthyl or a substituent of

10 the formula, —————— X_n [in which X represents hydrogen;

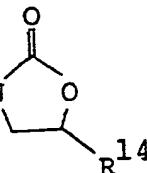
} halogen; $\text{C}_1\text{-C}_{12}$ alkyl; $\text{C}_1\text{-C}_6$ alkyl substituted with halogen, cyano, hydroxy, $\text{C}_1\text{-C}_5$ alkoxy or $\text{C}_2\text{-C}_6$ alkoxy carbonyl; $\text{C}_3\text{-C}_8$ cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of $\text{C}_1\text{-C}_4$ alkyl, 15 halogen and cyano; $\text{C}_2\text{-C}_4$ alkenyl substituted with halogen, hydroxy, $\text{C}_2\text{-C}_4$ alkoxy carbonyl or $\text{C}_2\text{-C}_6$ alkyl carbonyl; phenyl; hydroxy; $\text{C}_1\text{-C}_6$ alkoxy; $\text{C}_1\text{-C}_4$ alkoxy substituted

- 1 with halogen or C_2-C_6 alkoxy carbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylene dioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1-C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p 5 represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula $-COOR^6$ (in which R^6 represents hydrogen; alkali metal; C_1-C_{10} alkyl; C_1-C_5 alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxy-carbonyl or phenoxyphenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; 10 C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a substituent of the formula, $-S_n^7R^8R^9$
- (in which R^7 , R^8 and R^9 , which may be the same or different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl}); C_2-C_6 alkylcarbonyl; C_2-C_6 alkylcarbonyl substituted with cyano 15 or C_2-C_6 alkoxy carbonyl; benzoyl which may or may not be substituted with halogen or C_1-C_6 alkyl; C_2-C_6 alkylthio-carbonyl; C_3-C_7 alkoxy carbonyl carbonyl; a substituent of the formula, $-CN(R^{10})R^{11}$ (in which R^{10} and R^{11} , which may be the same or different, represent hydrogen, C_1-C_6 alkyl or 20 phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C_1-C_4 alkyls; a

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1 substituent of the formula, $-N\begin{array}{c} R^{12} \\ | \\ R^{13} \end{array}$ (in which R^{12} repre-

sents hydrogen or C_1-C_5 alkyl, and R^{13} represents formyl, C_2-C_{12} alkoxy carbonyl, or C_2-C_5 alkoxy carbonyl substituted with halogen or C_1-C_4 alkoxy); a substituent of the for-

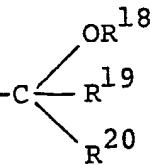
5 mula,  (in which R^{14} represents hydrogen, C_1-C_4

alkyl or C_2-C_6 alkoxy alkyl); a substituent of the formula,

$-C\begin{array}{c} BR^{15} \\ | \\ R^{17} \\ | \\ BR^{16} \end{array}$ (in which R^{15} and R^{16} , which may be the same or

different, represent C_1-C_4 alkyl or, taken together, may form C_1-C_4 alkylene, R^{17} represents C_1-C_5 alkyl, cyano or

10 C_2-C_6 alkoxy carbonyl, and B represents oxygen or sulfur); a

substituent of the formula,  (in which R^{18} repre-

sents hydrogen or C_2-C_4 alkyl carbonyl, and R^{19} and R^{20} ,

which may be the same or different, represent hydrogen or

C_1-C_6 alkyl); a substituent of the formula, $-Si\begin{array}{c} R^{21} \\ | \\ R^{22} \\ | \\ R^{23} \end{array}$ (in

15 which R^{21} , R^{22} and R^{23} , which may be the same or different, represent C_1-C_4 alkyl); or a substituent of the formula,

$-O-Si\begin{array}{c} R^{24} \\ | \\ R^{25} \\ | \\ R^{26} \end{array}$ (in which R^{24} , R^{25} , and R^{26} , which may be the

same or different, represent C_1-C_4 alkyl), and n represents

- 1 an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C_1-C_6 alkyl, C_1-C_4 haloalkyl, halogen, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_3 alkylene-
- 5 dioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $-S(O)_qR^{27}$ (in which R^{27} represents C_1-C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2-C_5 alkoxy-
- carbonyl or a substituent of the formula, $-N\begin{array}{c} R^{28} \\ | \\ R^{29} \end{array}$ (in
- 10 which R^{28} and R^{29} , which may be the same or different, represent hydrogen, C_1-C_4 alkyl, or benzyl which may or may not be substituted with C_2-C_6 alkoxy carbonyl); Z^1 represents oxygen or sulfur; Z^2 represents oxygen, sulfur or single bond; Q represents C_1-C_8 alkylene, C_1-C_8 alkylene substituted with halogen or phenyl, C_3-C_{12} alkenylene,
- 15 C_3-C_{12} haloalkylene or C_3-C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different.

The terms "alkyl, alkylene, alkenylene and alkynylene" as used herein mean straight-chain or branched alkyl, alkylene, alkenylene and alkynylene groups, respectively. The term "halo" means halogen such as fluorine, bromine, chlorine, etc., and the term "haloalkyl" means an alkyl group substituted with one or more halogen atoms which may be the same or different.

The compounds represented by the foregoing

1 general formula (I) are novel compounds not described in
the literatrues. They have excellent insecticidal activity
against insects belonging to Lepidoptera such as diamond-
back moth, cabbage armyworm, tobacco cutworm, rice stem
5 borer, etc., insects belonging to Hemiptera such as brown
planthoper, green peach aphid, etc. and mites. In
addition, they have excellent fungicidal activity against
diseases of vegetables, fruit trees, flowers and ornamental
plants, etc., such as rice blast, powdery mildew, downy
10 mildew, crown rust, leaf blight, sheath blight, purple
stain, etc.

Of the compounds of the present invention, those
which are particularly useful as an insecticide and
acaricide will be shown below:

15 Tert-butyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-
yl)methyleneaminooxymethyl]benzoate

Tert-butyl 4-[(5-(4-fluorophenoxy)-1,3-dimethyl-
pyrazol-4-yl)-methyleneaminooxymethyl]benzoate

20 Tert-pentyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-
yl)methyleneaminooxymethyl]benzoate

Cyclohexyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-
yl)methyleneaminooxymethyl]benzoate

1-Methylcyclohexyl 4-[(1,3-dimethyl-5-phenoxy-
pyrazol-4-yl)methyleneaminooxymethyl]benzoate

25 2-Chloromethyl-2-propyl 4-[(1,3-dimethyl-5-
phenoxy)pyrazol-4-yl)methyleneaminooxymethyl]benzoate

Tert-pentyl 4-[(1-methyl-5-phenoxy-3-trifluoro-
methyl)pyrazol-4-yl)methyleneaminooxymethyl]benzoate

- 1 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-tert-butylbenzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(1-cyanocyclopentyl)benzyl ether
5 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(2,2-dichloro-1-methylcyclopropyl)benzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-trimethylsilylbenzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
10 oxime O-4-(1,1,2,2-tetrafluoroethoxy)benzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-tert-butoxybenzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(heptafluoropropylthio)benzyl ether
15 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(heptafluoropropylsulfinyl)benzyl ether
1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(1,1,2,2-tetrafluoroethylthio)benzyl ether
N,N-diisopropyl 4-[(1,3-dimethyl-5-phenoxy-
20 pyrazol-4-yl)methyleneaminoxyethyl]benzamide
Tert-butyl 4-[(1,3-dimethyl-5-phenoxyprazole-4-
y1)methyleneaminoxyethyl]phenyl ketone
2-Isopropyl-2-[4-[(1,3-dimethyl-5-phenoxyprazole-
4-yl)methyleneaminoxyethyl]phenyl]-1,3-dioxolane
25 2-Isopropyl-2-[4-[(1,3-dimethyl-5-phenoxyprazole-
4-yl)methyleneaminoxyethyl]phenyl]-1,3-dithiolane
Tert-butyl N-4-[(1,3-dimethyl-5-phenoxyprazole-4-
y1)methyleneaminoxyethyl]phenyl-N-ethylcarbamate

1 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-2-(4-tert-butylphenoxy)ethyl ether

Also, compounds particularly useful as a fungicide will be shown below:

5 Isopropyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneamino]benzoate

Isopropyl 4-[{5-(4-fluorophenoxy)-1,3-dimethyl-pyrazol-4-yl}-methyleneaminoxy]methylbenzoate

1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde

10 oxime O-4-(methythio)benzyl ether

**1,3-Dimethyl-5-phenoxypraxole-4-carbaldehyde
oxime O-4-(difluoromethylsulfinyl)benzyl ether**

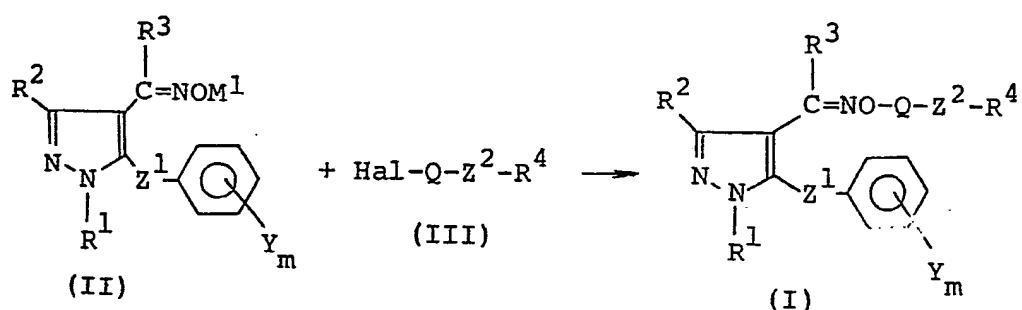
N,N-dimethyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneamino]oxymethylbenzamide

15 Methyl N-4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl]-
methylenaminooxymethyl]phenyl-N-ethylcarbamate

5-Ethyl-3-[N'-4-((1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneamino]oxymethyl]phenyl-2-oxazolidone

The compounds represented by the general formula
20 (I) can be synthesized, for example, by methods A, B, C and
D shown below in chemical formulas:

Method A:



1 wherein R¹, R², R³, R⁴, Q, Y, Z¹, Z², m and n are as
defined above, Hal represents a halogen atom and M¹
represents a hydrogen atom or an alkali metal atom.

The pyrazole oxime derivatives represented by the
5 general formula (I) can be obtained by reacting a compound
of the general formula (II) with a compound of the general
formula (III) in an inert solvent in the presence or
absence of a base.

Solvents which can be used in the present invention
10 may be any of those not disturbing the reaction, and
include for example alcohols (e.g. isopropanol, tert-
butanol, diethylene glycol), ketones (e.g. acetone, methyl
ethyl ketone, cyclohexanone), ethers (e.g. diethyl ether,
diisopropyl ether, tetrahydrofuran, dioxane, monoglyme,
15 diglyme), halogenated hydrocarbons (e.g. dichloroethane,
chloroform, carbon tetrachloride, tetrachloroethane),
aromatic hydrocarbons (e.g. benzene, chlorobenzene,
nitrobenzene, toluene), nitriles (e.g. acetonitrile),
dimethyl sulfoxide, dimethylformamide and water. These
20 solvents can be used alone or in combination. When a two-
phase reaction is carried out using the solvents in
combination, phase transfer catalysts such as triethyl-
benzylammonium chloride, trioctylmethylammonium chloride,
etc. may be used.

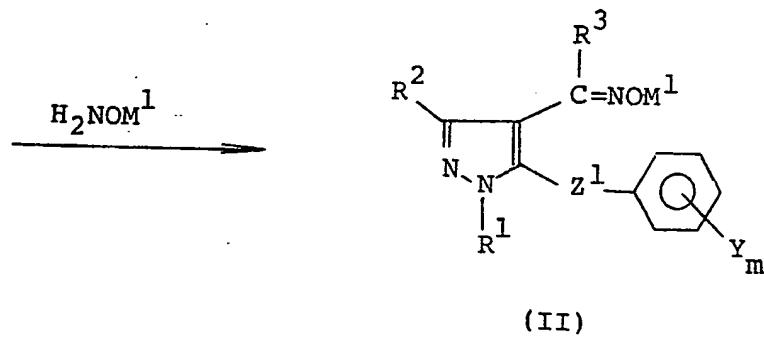
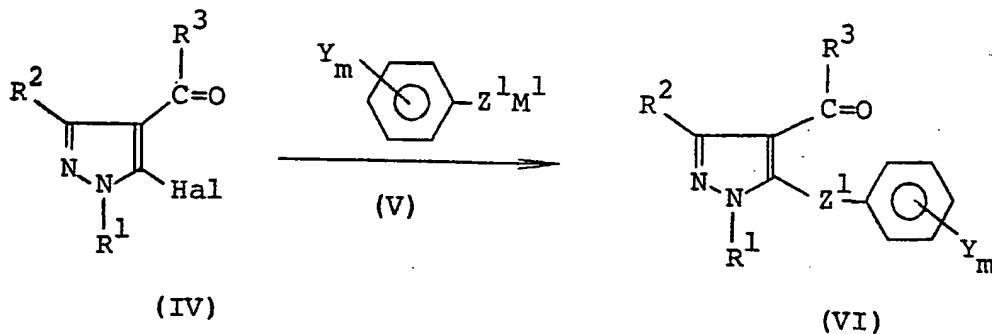
25 For the base, inorganic and organic bases can be
used. The inorganic bases include for example alkali or
alkaline earth metal carbonates such as sodium carbonate,
potassium carbonate, calcium carbonate, sodium

1 hydrogencarbonate, etc., alkali or alkaline earth metal hydroxides such as sodium hydroxide, potassium hydroxide, calcium hydroxide, etc., and alkali metal hydrides such as lithium hydride, sodium hydride, etc.

5 The organic bases include for example diethylamine, triethylamine, pyridine, 4-dimethylaminopyridine, etc.

As to the amount of the base used, it suffices to use an amount equimolar to the compound represented by the
10 general formula (II), but amounts in excess thereof will do.

The compound of the general formula (II) used in the present invention can be produced, for example, by the method described below:

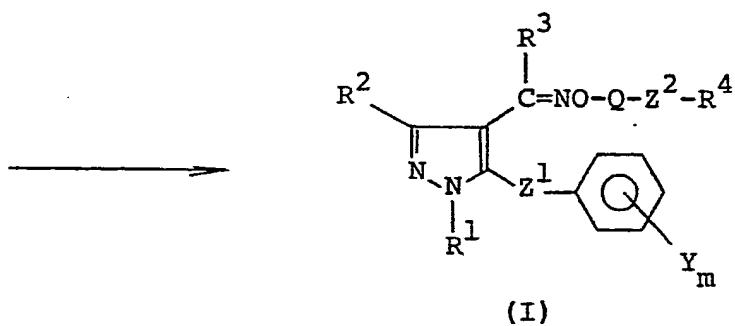
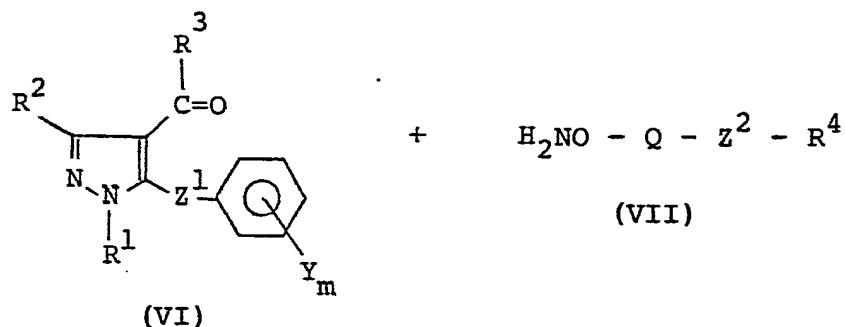


1 wherein R^1 , R^2 , R^3 , Y , Z^1 , m , Hal and M^1 are as defined above.

That is, the compound of the general formula (II) can be produced by reacting a compound of the general formula (IV) with a compound of the general formula (V) in a suitable solvent and subsequently reacting the resulting compound of the general formula (VI) with hydroxylamine.

Among the compounds represented by the general formula (III), especially when Q is methylene, Z^2 is a single bond and R^4 is a substituted phenyl group, are also some novel compounds, but they can be produced in the same manner as in the case of the known compounds.

Method B:



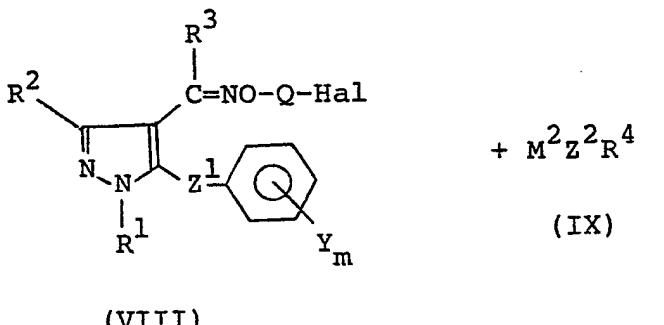
1 wherein R^1 , R^2 , R^3 , R^4 , Q , Y , Z^1 , Z^2 , m and n are as defined above.

The pyrazole oxime derivatives represented by the general formula (I) can be obtained by reacting a compound 5 of the general formula (VI) with a compound of the general formula (VII) in an inert solvent.

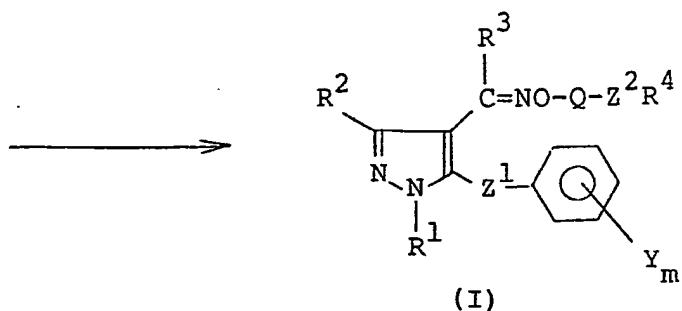
For the solvent which can be used in this reaction, there are mentioned the solvents except ketones shown in Method A.

10 The compound represented by the general formula (VII) can be produced according to the well-known method, for example, described in Methoden der Organischen Chemie (Hougen Weyl) Band X/I Stickstoffverbindungen Teil I, p 1192.

15 Method C:



(VIII)



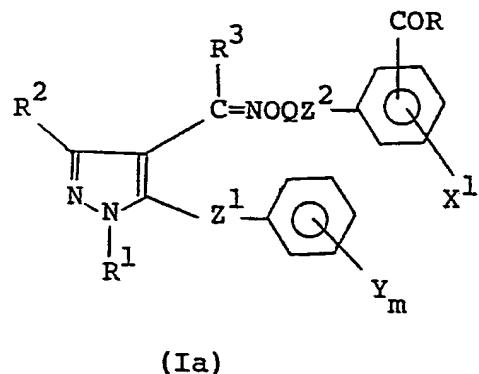
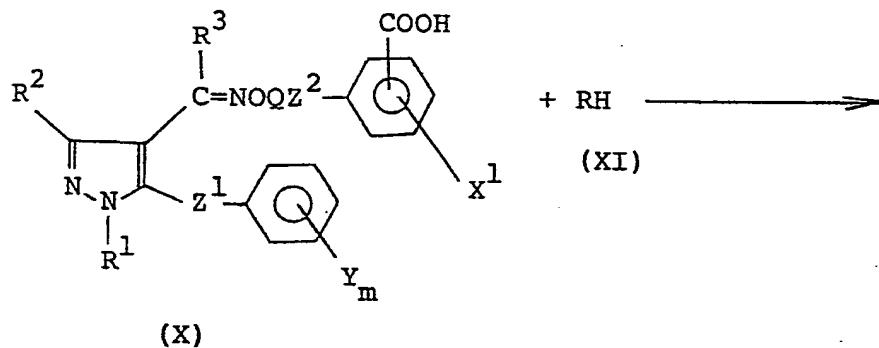
(I)

1 wherein R^1 , R^2 , R^3 , R^4 , Q, Y, Z^1 , Z^2 , m and n are as
defined above, and M^2 represents a hydrogen atom or an
alkali metal atom.

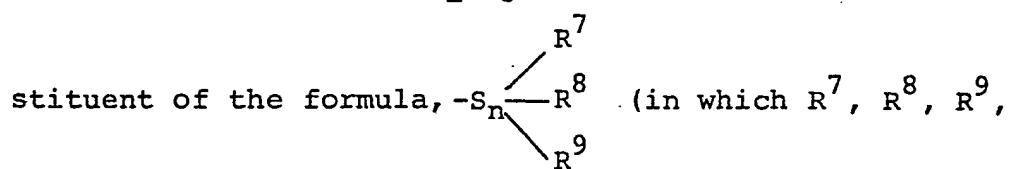
The pyrazole oxime derivatives represented by the
5 general formula (I) can be obtained by reacting a compound
of the general formula (VIII) with a compound of the
general formula (IX) in an inert solvent in the presence or
absence of a base.

For the solvent and base which can be used in
10 this reaction, there are mentioned the solvents and bases
shown in Method A.

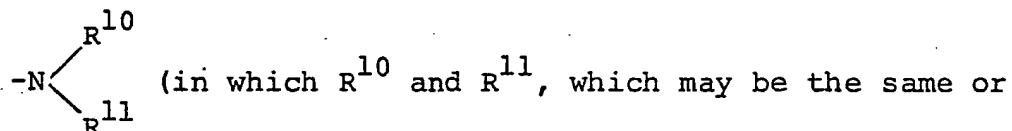
Method D:



- 1 wherein R^1 , R^2 , R^3 , Q , Y , Z^1 , Z^2 and m are as defined above; X^1 represents hydrogen or C_1-C_4 alkyl; and R represents a substituent of the formula, $-OW$ {in which W represents alkali metal; C_1-C_{10} alkyl; alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxy carbonyl or phenyl; C_2-C_7 alkenyl; C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a sub-
- 5



- which may be the same or different, represent C_1-C_4
10 alkyl or C_3-C_8 cycloalkyl}), a substituent of the formula,



- different, represent hydrogen, C_1-C_6 alkyl or phenyl); piperidino; morpholino which may or may not be substituted with one or two C_1-C_4 alkyls; or C_2-C_6 alkyl-
15 thio.

That is, the pyrazole oxime derivatives represented by the general formula (Ia) can be obtained by reacting a compound of the general formula (X) with a compound of the general formula (XI) in an inert solvent in the presence of a dehydrating agent. The compound (X) may be reacted with the compound (XI) after converting it to acid chloride.

Solvents which can be used in this reaction may be any of those not disturbing the reaction, and

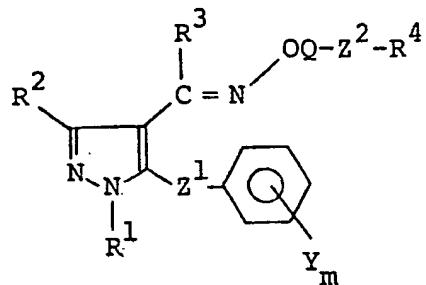
1 include for example ethers (e.g. diethyl ether, tetra-
hydrofuran, dioxane, diethylene glycol), halogenated
hydrocarbons (e.g. dichloromethane, chloroform, carbon
tetrachloride), dimethyl sulfoxide, dimethylformamide,
5 etc. These solvents may be used alone or in combination.

In the methods A to D, the reaction temperature
may properly be selected from a range of from room
temperature to the boiling point of the solvent. The
reaction time depends upon the reaction temperature and
10 reaction scale, but it may properly be selected from a
range of from 1 minute to 48 hours.

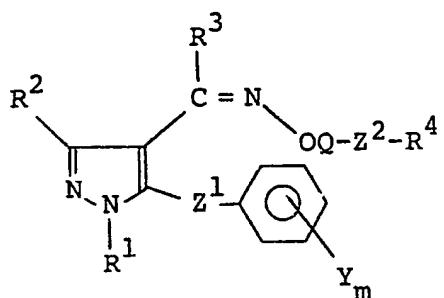
As to the molar ratio of the reagents in
practicing the reaction of the present invention, they
are used in equimolar amounts because this reaction is an
15 equimolar reaction, but either one of them may be used
in excess of the other.

After completion of the reaction, the desired
compound can be separated by the usual methods, and if
necessary, can be purified by recrystallization, column
20 chromatography, etc.

The pyrazole oxime derivatives represented by
the general formula (I) have two isomers, E-isomer and
Z-isomer. In the scope of the present invention are
also included the both isomers and their mixtures.



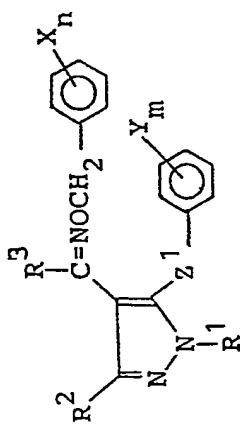
E-isomer



Z-isomer

1 Representative examples of the pyrazole oxime derivatives represented by the general formula (I) will be shown in Table 1, but the derivatives are not limited to these examples.

Table 1(a)



(Ib)

This formula corresponds to the general formula
 (I) wherein Q is a methylene group, Z² is a
 single bond and R⁴ is

Compound No.	R ¹	R ²	R ³	X _n	Y _m	Z ¹	Physical property m.p. (°C) or refractive index
1	CH ₃	CH ₃	H	2-COOCH ₃	H	0	n _D ²⁰ 1.5772
2	CH ₃	CH ₃	H	2-COOCH ₃	4-F	0	n _D ²⁰ 1.5656
3	CH ₃	CH ₃	H	2-COOCH ₃	4-Cl	0	n _D ²⁰ 1.5788
4	CH ₃	CH ₃	H	2-COOCH ₃	4-OCH ₃	0	n _D ²⁰ 1.5654
5	CH ₃	CH ₃	H	2-COOCH ₃	H	0	n _D ²⁰ 1.5462
6	CH ₃	CH ₃	H	2-COOCH ₃	4-F	0	n _D ²⁰ 1.5446
7	CH ₃	CH ₃	H	2-COOCH ₃	4-OCH ₃	0	n _D ²⁰ 1.5579

- Cont'd -

0234045

Table 1 (a) (Cont'd)

— Cont'd —

Table 1(a) (Cont'd)

25	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -n	4-F	0	n _D ²⁰	1.5579
26	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -n	4-OCH ₃	0	n _D ²⁰	1.5628
27	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	H	0	n _D ²⁰	1.5321
28	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-CH ₃	0	n _D ²⁰	1.5608
29	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	3-C ₂ H ₅	0	n _D ²⁰	1.5512
30	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-C ₂ H ₅	0	n _D ²⁰	1.5579
31	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-C ₄ H ₉ -t	0	n _D ²⁰	1.5471
32	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	2-F	0	n _D ²⁰	1.5523
33	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	3-F	0	n _D ²⁰	1.5531
34	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-F	0	n _D ²⁰	1.5541
35	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	3-Cl	0	n _D ²⁰	1.5610
36	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-Cl	0	n _D ²⁰	1.5608
37	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	2,4-Cl ₂	0	n _D ²⁰	1.5640
38	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	3,4-Cl ₂	0	n _D ²⁰	1.5648
39	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	4-Br	0	n _D ²⁰	1.5618
40	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	2-OCH ₃	0	n _D ²⁰	1.5586
41	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -l	3-OCH ₃	0	n _D ²⁰	1.5585

- Cont'd -

Table 1(a) (Cont'd)

42	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	4-OCH ₃	n _D ²⁰	1.5597
43	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	3, 5-(OCH ₃) ₂	n _D ²⁰	1.5621
44	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	4-OC ₂ H ₅	n _D ²⁰	1.5536
45	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	4-SCH ₃	n _D ²⁰	1.5819
46	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	4-S(O)CH ₃	n _D ²⁰	1.5729
47	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	4-S(O) ₂ CH ₃	n _D ²⁰	1.5633
48	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	3, 4(-OCH ₂ O-)	n _D ²⁰	1.5593
49	CH ₃	CH ₃	H	4-COOCH ₃ H ₇ -i	3-N(CH ₃) ₂	n _D ²⁰	1.5649
50	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -n	H	n _D ²⁰	1.5619
51	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -n	4-F	n _D ²⁰	1.5536
52	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -n	4-Cl	n _D ²⁰	1.5629
53	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -n	4-OCH ₃	n _D ²⁰	1.5536
54	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -s	H	n _D ²⁰	1.5602
55	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -s	4-F	n _D ²⁰	1.5541
56	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -s	4-OCH ₃	n _D ²⁰	1.5594
57	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -i	H	n _D ²⁰	1.5629
58	CH ₃	CH ₃	H	4-COOCH ₄ H ₉ -i	4-F	n _D ²⁰	1.5561

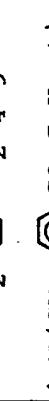
- Cont'd -

Table 1 (a) (Cont'd)

59	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-OCH ₃	n _D ²⁰	1.5608
60	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	H	m.p.	101.7
61	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-CH ₃	m.p.	73.0
62	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	3-C ₂ H ₅	n _D ²⁰	1.5542
63	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-C ₂ H ₅	n _D ²⁰	1.5440
64	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-C ₄ H ₉ -t	n _D ²⁰	1.5423
65	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	2-F	m.p.	92.1
66	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	3-F	m.p.	73.9
67	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-F	m.p.	86.8
68	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	3-Cl	n _D ²⁰	1.5632
69	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-Cl	Paste	-
70	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-Br	n _D ²⁰	1.5660
71	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	3-CF ₃	n _D ²⁰	1.5150
72	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	2-OCH ₃	m.p.	72.3
73	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	3-OCH ₃	n _D ²⁰	1.5663
74	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-OCH ₃	n _D ²⁰	1.5566
75	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	4-OH	m.p.	145.0

Cont'd -

Table 1 (a)

76	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-OC ₂ H ₅	0	n _D ²⁰	1.5487
77	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-SCH ₃	0	n _D ²⁰	1.5653
78	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-S(O)CH ₃	0	n _D ²⁰	1.5620
79	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-S(O) ₂ CH ₃	0	n _D ²⁰	1.5521
80	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-CO ₂ C ₃ H ₇ -n	0	n _D ²⁰	1.5641
81	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	3,4(-OCH ₂ O-)	0	n _D ²⁰	1.5515
82	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	3-N(CH ₃) ₂	0	n _D ²⁰	1.5538
83	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-NHCH ₂  CO ₂ C ₄ H ₉ -t	0	n _D ²⁰	1.5605
84	CH ₃	CH ₃	H	4-COOCH ₂ H ₉ -t	4-N(CH ₂)  CO ₂ C ₄ H ₉ -t) ₂	0	n _D ²⁰	1.5689
85	CH ₃	CH ₃	H	4-COO(CH ₃) ₂ C ₂ H ₅	H	0	n _D ²⁰	1.5564
86	CH ₃	CH ₃	H	4-COO(CH ₃) ₂ C ₂ H ₅	3-F	0	n _D ²⁰	1.5413
87	CH ₃	CH ₃	H	4-COO(CH ₃) ₂ C ₂ H ₅	4-F	0	n _D ²⁰	1.5529
88	CH ₃	CH ₃	H	4-COO(CH ₂) ₂ C ₂ H ₅	3-OCH ₃	0	n _D ²⁰	1.5530
89	CH ₃	CH ₃	H	4-COO(CH ₃) ₂ C ₂ H ₅	4-OCH ₃	0	n _D ²⁰	1.5592
90	CH ₃	CH ₃	H	4-COOCH(C ₂ H ₅) ₂	H	0	n _D ²⁰	1.5590
91	CH ₃	CH ₃	H	4-COOCH(C ₂ H ₅) ₂	4-F	0	n _D ²⁰	1.5502

- Cont'd -

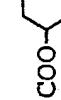
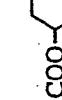
Table 1(a) (Cont'd)

92	CH ₃	CH ₃	H	4-COOCH(C ₂ H ₅) ₂	4-OCH ₃	0	n _D ²⁰	1.5591
93	CH ₃	CH ₃	H	4-COOCH ₂ C ₄ H ₉ -t	H	0	n _D ²⁰	1.5538
94	CH ₃	CH ₃	H	4-COOCH ₂ C ₄ H ₉ -t	4-F	0	n _D ²⁰	1.5470
95	CH ₃	CH ₃	H	4-COOCH ₂ C ₄ H ₉ -t	4-OCH ₃	0	n _D ²⁰	1.5509
96	CH ₃	CH ₃	H	4-COO-	4-OCH ₃	0	n _D ²⁰	1.5653
97	CH ₃	CH ₃	H	4-COO-	4-F	0	n _D ²⁰	1.5537
98	CH ₃	CH ₃	H	4-COO-	4-OCH ₃	0	n _D ²⁰	1.5695
99	CH ₃	CH ₃	H	4-COO-	4-F	0	n _D ²⁰	1.5604
100	CH ₃	CH ₃	H	4-COO-	4-OCH ₃	0	n _D ²⁰	1.5525
101	CH ₃	CH ₃	H	4-COO-	4-OCH ₃	0	n _D ²⁰	1.5599
102	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH=CH ₂	H	0	n _D ²⁰	1.5611
103	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH=CH ₂	4-F	0	n _D ²⁰	1.5558
104	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH=CH ₂	4-OCH ₃	0	n _D ²⁰	1.5620

- Cont'd -

- 22 -

Table 1 (a) (Cont'd)

105	CH ₃	CH ₃	H	4-COOCH(C ₂ H ₅)C≡CH	H								
106	CH ₃	CH ₃	H	4-COOOC ₆ H ₁₃ -n	H								
107	CH ₃	CH ₃	H	4-COOOC ₆ H ₁₃ -n	4-F								
108	CH ₃	CH ₃	H	4-COOOC ₆ H ₁₃ -n	4-OCH ₃								
109	CH ₃	CH ₃	H	4-COO(C ₂ H ₃) ₂ C ₃ H ₇ -t	H								
110	CH ₃	CH ₃	H	4-COO(C ₂ H ₃) ₂ C ₃ H ₇ -t	3-F								
111	CH ₃	CH ₃	H	4-COO(C ₂ H ₃) ₂ C ₃ H ₇ -t	4-F								
112	CH ₃	CH ₃	H	4-COO(C ₂ H ₅) ₂ CH ₃	H								
113	CH ₃	CH ₃	H	4-COO(C ₂ H ₅) ₂ CH ₃	4-F								
114	CH ₃	CH ₃	H	4-COO(C ₂ H ₅) ₂ CH ₃	4-OCH ₃								
115	CH ₃	CH ₃	H	4-COOCH(CH ₃)C ₄ H ₉ -t	H								
116	CH ₃	CH ₃	H	4-COOCH(CH ₃)C ₄ H ₉ -t	4-F								
117	CH ₃	CH ₃	H	4-COOCH(CH ₃)C ₄ H ₉ -t	4-OCH ₃								
118	CH ₃	CH ₃	H	4-COO- 	H								
119	CH ₃	CH ₃	H	4-COO- 	4-F								
						Paste							
							O						
								n _D ²⁰	1.5863				

- Cont'd -

Table I (a) (Cont'd)

120	CH ₃	CH ₃	H	4-COO-	Cyclohexyl	4-Cl	n _D ²⁰	1.5960
121	CH ₃	CH ₃	H	4-COO-	Cyclohexyl	4-OCH ₃	n _D ²⁰	1.5976
122	CH ₃	CH ₃	H	4-COO-	Cyclohexyl	H	n _D ²⁰	1.5621
123	CH ₃	CH ₃	H	4-COO-	Cyclohexyl	4-F	n _D ²⁰	1.5511
124	CH ₃	CH ₃	H	4-COO-	Cyclohexyl	4-OCH ₃	n _D ²⁰	1.5541
125	CH ₃	CH ₃	H	CH ₃	4-COO-	Cyclohexyl	n _D ²⁰	1.5584
126	CH ₃	CH ₃	H	CH ₃	4-COO-	Cyclohexyl	n _D ²⁰	1.5370

- Cont'd -

Table 1(a) (Cont'd)

127	CH ₃	CH ₃	H	4-COOCH ₃	CH ₃	4-OCH ₃	n _D ²⁰	1.5492
128	CH ₃	CH ₃	H	4-COO-	C ₃ H ₇ -1	CH ₃	n _D ²⁰	1.5552
129	CH ₃	CH ₃	H	4-COO-	C ₃ H ₇ -1	CH ₃	n _D ²⁰	1.5541
130	CH ₃	CH ₃	H	4-COOCH(C ₃ H ₇ -1) 2		H	n _D ²⁰	1.5471
131	CH ₃	CH ₃	H	4-COOCH(C ₃ H ₇ -1) 2		4-F	n _D ²⁰	1.5400
132	CH ₃	CH ₃	H	4-COOCH(C ₃ H ₇ -1) 2		4-OCH ₃	n _D ²⁰	1.5490
133	CH ₃	CH	H	4-COOOC(C ₂ H ₅) 3		H	n _D ²⁰	1.5465
134	CH ₃	CH ₃	H	4-COOOC(C ₂ H ₅) 3		4-F	n _D ²⁰	1.5462
135	CH ₃	CH ₃	H	4-COOOC(C ₂ H ₅) 3		4-OCH ₃	n _D ²⁰	1.5518
136	CH ₃	CH ₃	H	4-COOCH(CH ₃) 		H	n _D ²⁰	1.5730

- Cont'd -

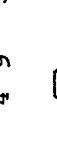
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Table 1 (a) (Cont'd)

137	CH ₃	CH ₃	H	4-COOCH ₂ C ₆ H ₄ O C ₆ H ₄ O	H	H	0	n _D ²⁰	1.5901
138	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ O C ₆ H ₄ O	H	H	0	n _D ²⁰	1.5675
139	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ OCH ₃	H	H	0	n _D ²⁰	1.5672
140	CH ₃	CH ₃	H	4-COOCH(CH ₃)CH ₂ OCH ₃	H	H	0	n _D ²⁰	1.5563
141	CH ₃	CH ₃	H	4-COO(CH ₃) ₂ CO ₂ CH ₃	H	H	0	n _D ²⁰	1.5583
142	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ O C ₆ H ₄ O	4-F	4-F	0	n _D ²⁰	1.5655
143	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ O C ₆ H ₄ O	4-Cl	4-Cl	0	n _D ²⁰	1.5685
144	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ O C ₆ H ₄ O	4-OCH ₃	4-OCH ₃	0	n _D ²⁰	1.5764
145	CH ₃	CH ₃	H	4-COOCH ₂ H ₄ OCH ₃	4-OCH ₃	4-OCH ₃	0	n _D ²⁰	1.5695
146	CH ₃	CH ₃	H	4-COOCH ₂ CF ₃	H	H	0	n _D ²⁰	1.5491
147	CH ₃	CH ₃	H	4-COOCH ₂ CF ₃	4-F	4-F	0	n _D ²⁰	1.5409
148	CH ₃	CH ₃	H	4-COOCH ₂ CF ₃	4-Cl	4-Cl	0	n _D ²⁰	1.5450
149	CH ₃	CH ₃	H	4-COOCH ₂ CF ₃	4-OCH ₃	4-OCH ₃	0	n _D ²⁰	1.5459

- Cont'd -

Table 1(a) (Cont'd)

150	CH ₃	CH ₃	H	4-COOCH(CF ₃) ₂	H	n _D ²⁰	1.5563
151	CH ₃	CH ₃	H	4-COOCH(CF ₃) ₂	4-F	n _D ²⁰	1.5632
152	CH ₃	CH ₃	H	4-COOCH(CF ₃) ₂	4-OCH ₃	n _D ²⁰	1.5664
153	CH ₃	CH ₃	H	4-COOCH(CH ₂ Cl) ₂	H	n _D ²⁰	1.5451
154	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	H	n _D ²⁰	1.5662
155	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	3-F	n _D ²⁰	1.5520
156	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	4-F	n _D ²⁰	1.5598
157	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	3-Cl	n _D ²⁰	1.5651
158	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	4-Cl	n _D ²⁰	1.5639
159	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	3-OCH ₃	n _D ²⁰	1.5602
160	CH ₃	CH ₃	H	4-COOC(CH ₃) ₂ CH ₂ Cl	4-OCH ₃	n _D ²⁰	1.5665
161	CH ₃	CH ₃	H	4-COO- 	H	n _D ²⁰	1.5656
162	CH ₃	CH ₃	H	4-COO-Sn(C ₄ H ₉ -n) ₃	H	n _D ²⁰	1.5600
163	CH ₃	CH ₃	H	4-COO-Sn(- ) ₃	H	n _D ²⁰	1.5603
164	CH ₃	CF ₃	H	4-COOC(CH ₃) ₂ C ₂ H ₅	H	n _D ²⁰	1.5260

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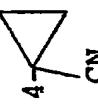
Table 1 (a) (Cont'd)

165	CH ₃	CH ₃	CH ₃	4-COOH	H	O	Paste
166	CH ₃	CH ₃	CH ₃	4-COOOC ₄ H ₉ -t	H	O	m.p. 94.4
167	CH ₃	CH ₃	C ₂ H ₅	4-COOOC ₄ H ₉ -t	H	O	²⁰ n _D 1.5536
168	CH ₃	CH ₃	○	4-COOOC ₄ H ₉ -t	H	O	²⁰ n _D 1.5644
169	CH ₃	CH ₃	CH ₃	4-COO(CH ₃) ₂ C ₂ H ₅	H	O	m.p. 60.9
170	CH ₃	CH ₃	CH ₃	4-COOOC ₂ H ₅	H	O	²⁰ n _D 1.5570
171	CH ₃	CH ₃	CH ₃	4-COOOC(CH ₃) ₂ CH ₂ Cl	H	O	²⁰ n _D 1.5578
172	CH ₃	C ₃ H ₇ -1	H	4-COOOC ₃ H ₇ -i	H	O	²⁰ n _D 1.5491
173	CH ₃	H	H	4-COOOC ₄ H ₉ -t	H	O	Paste
174	CH ₃	CH ₃	H	4-COOOC ₃ H ₇ -i	H	S	²⁰ n _D 1.5821
175	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	H	S	m.p. 112.3
176	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	H	S(O)	²⁰ n _D 1.5649
177	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t	H	S(O) ₂	²⁰ n _D 1.5689
178	CH ₃	CH ₃	H	4-COOOC ₄ H ₉ -t, 5-CH ₃	H	O	Paste
						- Cont'd -	
					- 28 -		

Table 1(a) (Cont'd)

- Cont'd -

Table 1(a) (Cont'd)

194	CH ₃	CH ₃	H	4-CF ₃	4-F		n _D ²⁰ 1.5355
195	CH ₃	CH ₃	H	4-CF ₃	4-Cl		n _D ²⁰ 1.5539
196	CH ₃	CH ₃	H	4-C ₂ H ₅	H		n _D ²⁰ 1.5739
197	CH ₃	CH ₃	H	4-C ₃ H ₇ -i	H		n _D ²⁰ 1.5594
198	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CN	H		m.p. 77.4
199	CH ₃	CH ₃	H		H		m.p. 109.1
200	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CN	4-F		m.p. 94.7
201	CH ₃	CH ₃	H	4-C ₄ H ₉ -n	H		n _D ²⁰ 1.5567
202	CH ₃	CH ₃	H	4-C ₄ H ₉ -n	4-Cl		n _D ²⁰ 1.5665
203	CH ₃	CH ₃	H	4-C ₄ H ₉ -s	H		n _D ²⁰ 1.5631
204	CH ₃	CH ₃	H	4-C ₄ H ₉ -i	H		n _D ²⁰ 1.5628
205	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	H		n _D ²⁰ 1.5402
206	CH ₃	CH ₃	H	3-CH ₃	3-CH ₃		n _D ²⁰ 1.5605
207	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-CH ₃		m.p. 112.4

- Cont'd -

Table 1(a) (Cont'd)

208	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3-C ₂ H ₅	0	n _D ²⁰ 1.5539
209	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-C ₂ H ₅	0	m.p. 79.0
210	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-C ₄ H ₉ -t	0	n _D ²⁰ 1.5475
211	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	2-F	0	m.p. 67.7
212	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3-F	0	m.p. 66.9
213	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-F	0	n _D ²⁰ 1.5507
214	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	2-Cl	0	n _D ²⁰ 1.5633
215	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3-Cl	0	n _D ²⁰ 1.5573
216	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-Cl	0	n _D ²⁰ 1.5653
217	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-Br	0	n _D ²⁰ 1.5636
218	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3-CF ₃	0	n _D ²⁰ 1.5352
219	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	2-OCH ₃	0	m.p. 76.3
220	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3-OCH ₃	0	n _D ²⁰ 1.6590
221	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-OCH ₃	0	n _D ²⁰ 1.5584
222	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	3, 5-(OCH ₃) ₂	0	n _D ²⁰ 1.5535
223	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-OC ₂ H ₅	0	n _D ²⁰ 1.5555

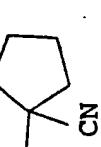
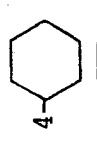
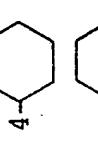
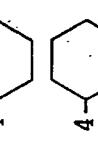
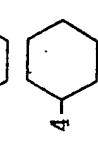
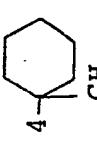
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Table 1(a) (Cont'd)

224	CH ₃	CH ₃	H	4-C ₄ H ₉ -t		4-CO ₂ C ₃ H ₇ -n		0	n _D ²⁰	1.5532			
225	CH ₃	CH ₃	H	4-C ₄ H ₉ -t		3,4(-OCH ₂ O-)		0	m.p.	111.4			
226	CH ₃	CH ₃	H	4-C ₄ H ₉ -t		3-N(CH ₃) ₂		0	n _D ²⁰	1.5858			
227	CH ₃	CH ₃	H	4-C ₄ H ₉ -t		4-N(CH ₂ Ph)C ₄ H ₉ -t) ₂		0	n _D ²⁰	1.5712			
228	CH ₃	CH ₃	H	4-C ₅ H ₁₁ -n		H		0	n _D ²⁰	1.5546			
229	CH ₃	CH ₃	H	4-CH(CH ₃)C ₃ H ₇ -n		H		0	n _D ²⁰	1.5640			
230	CH ₃	CH ₃	H	4-CH(CH ₃)C ₃ H ₇ -n		4-F		0	n _D ²⁰	1.5568			
231	CH ₃	CH ₃	H	4-CH(CH ₃)'C ₃ H ₇ -n		4-Cl		0	n _D ²⁰	1.5650			
232	CH ₃	CH ₃	H	4-C(CH ₃) ₂ C ₂ H ₅		H		0	n _D ²⁰	1.5633			
233	CH ₃	CH ₃	H	4-C(CH ₃) ₂ C ₂ H ₅		2-F		0	n _D ²⁰	1.5440			
234	CH ₃	CH ₃	H	4-C(CH ₃) ₂ C ₂ H ₅		4-F		0	n _D ²⁰	1.5539			
235	CH ₃	CH ₃	H	4-C(CH ₃) ₂ C ₂ H ₅		4-Cl		0	n _D ²⁰	1.5678			
236	CH ₃	CH ₃	H	4-C(CH ₃) ₂ C ₂ H ₅		4-OCH ₃		0	n _D ²⁰	1.5584			
237	CH ₃	CH ₃	H					0	n _D ²⁰	1.5612			

- Cont'd -

Table 1(a) (Cont'd)

				3-OCH ₃			
							²⁰ n _D
238	CH ₃	CH ₃	H				1.5632
239	CH ₃	CH ₃	H	4-CH(OH)C ₄ H ₉ -t	H		²⁰ n _D
240	CH ₃	CH ₃	H	4-CH(OH)C ₄ H ₉ -t	4-F	0	²⁰ n _D
241	CH ₃	CH ₃	H	4-CH(OH)C ₄ H ₉ -t	4-Cl	0	²⁰ n _D
242	CH ₃	CH ₃	H	4-C ₆ H ₁₃ -n	H	0	²⁰ n _D
243	CH ₃	CH ₃	H		H	0	²⁰ n _D
244	CH ₃	CH ₃	H		2-F	0	²⁰ n _D
245	CH ₃	CH ₃	H		4-F	0	²⁰ n _D
246	CH ₃	CH ₃	H		4-Cl	0	²⁰ n _D
247	CH ₃	CH ₃	H		3,5-(OCH ₃) ₂	0	²⁰ n _D
248	CH ₃	CH ₃	H		H	0	²⁰ n _D

- Cont'd -

Table 1(a) (Cont'd)

Table 1(a) (Cont'd)

263	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CO ₂ C ₂ H ₅	H			0	n _D ²⁰ 1.5320
264	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CO ₂ C ₂ H ₅	4-F			0	n _D ²⁰ 1.5502
265	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CO ₂ C ₃ H ₇ -t	H			0	n _D ²⁰ 1.5492
266	CH ₃	CH ₃	H		H			0	n _D ²⁰ 1.5680
267	CH ₃	CH ₃	H		4-F			0	n _D ²⁰ 1.5654
268	CH ₃	CH ₃	H		4-Cl			0	n _D ²⁰ 1.5660
269	CH ₃	CH ₃	H		4-OCH ₃			0	n _D ²⁰ 1.5653
270	CH ₃	CH ₃	H	2,4-(CH ₃) ₂				0	n _D ²⁰ 1.5654
271	CH ₃	CH ₃	H	2,4-(CH ₃) ₂	4-F			0	n _D ²⁰ 1.5672
272	CH ₃	CH ₃	H	3-OCH ₃ , 4-C ₄ H ₉ -t	H			0	n _D ²⁰ 1.5567
273	CH ₃	CH ₃	H	3-OCH ₃ , 4-C ₄ H ₉ -t	4-Cl			0	n _D ²⁰ 1.5572
274	CH ₃	CH ₃	H	2,4,6-(CH ₃) ₃	H			0	m.p. 94.5

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Table 1(a) (Cont'd)

275	CH ₃	CH ₃	H	2,6-(CH ₃) ₂ ' 4-C ₄ H ₉ -t	H		O	m.p. 111.0
276	CH ₃	CH ₃	H	2,6-(CH ₃) ₂ ' 4-C ₄ H ₉ -t	4-F		O	m.p. 97.9
277	CH ₃	CH ₃	H	2,6-(CH ₃) ₂ ' 4-C ₄ H ₉ -t	4-Cl		O	Paste
278	CH ₃	CH ₃	H	2,6-(CH ₃) ₂ ' 4-C ₄ H ₉ -t	4-OCH ₃		O	n _D ²⁰ 1.5528
279	CH ₃	H	H	H	4-Cl		O	n _D ²⁰ 1.5933
280	CH ₃	H	H	4-C ₄ H ₉ -t	H		O	n _D ²⁰ 1.5689
281	CH ₃	CH ₃	CH ₃	4-C ₄ H ₉ -t	H		O	n _D ²⁰ 1.5850
282	CH ₃	CH ₃	C ₂ H ₅	4-C ₄ H ₉ -t	H		O	n _D ²⁰ 1.5536
283	CH ₃	CH ₃	CH ₃	4-C ₄ H ₉ -t	4-Cyclohexyl		O	n _D ²⁰ 1.5775
284	CH ₃	C ₂ H ₅	H	4-C ₄ H ₉ -t	H		O	m.p. 99.2

- Cont'd -

Table 1(a) (Cont'd)

285	CH ₃	C ₃ H ₇ -t	H	4-C ₄ H ₉ -t	H		O	m.p. 71.5
286	CH ₃	○	H		4-Cl		O	²⁰ n _D 1.5966
287	CH ₃	○	H	4-	○		O	²⁰ n _D 1.6000
288	C ₂ H ₅	CH ₃	H	4-C ₄ H ₉ -t	H		O	²⁰ n _D 1.5521
289	○	CH ₃	H	4-C ₄ H ₉ -t	H		O	²⁰ n _D 1.5905
290	CH ₃	CH ₃	H		4-Cl		S	²⁰ n _D 1.5562
291	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	H		S	²⁰ n _D 1.5760
292	CH ₃	CH ₃	H	4-C(CH ₃)(CO ₂ C ₂ H ₅) ₂	H		O	²⁰ n _D 1.5515
293	CH ₃	CH ₃	H	4-C(CH ₃)(CO ₂ C ₂ H ₅) ₂	4-F		O	²⁰ n _D 1.5462
294	CH ₃	CH ₃	H	4-C(CH ₃)(CO ₂ C ₂ H ₅) ₂	4-Cl		O	²⁰ n _D 1.5567
295	CH ₃	CH ₃	H	4-C(CH ₃)(CO ₂ C ₂ H ₅) ₂	4-OCH ₃		O	²⁰ n _D 1.5553
296	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-SCH ₃		O	²⁰ n _D 1.5853
297	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-S(O)CH ₃		O	²⁰ n _D 1.5698
298	CH ₃	CH ₃	H	4-C ₄ H ₉ -t	4-S(O) ₂ CH ₃		O	m.p. 133.6

- Cont'd -

Table 1(a) (Cont'd)

299	CH ₃	CH ₃	H	4-C(CH ₃) ₂ CH ₂ F	H	H	0	paste
300	CH ₃	CH ₃	H	H	4-C1	H	n _D ²⁰	1.5586
301	CH ₃	CH ₃	H	H	4-C1	4-C1	0	n _D ²⁰
302	CH ₃	CH ₃	H	H	4-SCHF ₂	H	n _D ²⁰	1.5859
303	CH ₃	CH ₃	H	H	4-SCHF ₂	4-C1	0	n _D ²⁰
304	CH ₃	CH ₃	H	H	4-S(O)CHF ₂	H	0	n _D ²⁰
305	CH ₃	CH ₃	CH ₃	H	4-F	H	0	n _D ²⁰
306	CH ₃	CH ₃	CH ₃	H	4-F	4-C1	0	n _D ²⁰
307	CH ₃	CH ₃	CH ₃	H	2,3,4,5,6-F ₅	H	0	n _D ²⁰
308	CH ₃	CH ₃	CH ₃	H	2-C1	4-C1	0	n _D ²⁰
309	CH ₃	CH ₃	CH ₃	H	2-C1	H	0	n _D ²⁰
310	CH ₃	CH ₃	CH ₃	H	3-C1	4-C1	0	n _D ²⁰
311	CH ₃	CH ₃	CH ₃	H	3-C1	H	0	n _D ²⁰
312	CH ₃	CH ₃	CH ₃	H	4-C1	H	0	n _D ²⁰
313	CH ₃	CH ₃	CH ₃	H	4-C1	H	S	n _D ²⁰
314	CH ₃	CH ₃	CH ₃	H	4-C1	2-C1	0	n _D ²⁰

- Cont'd -

Table 1(a) (Cont'd)

315	CH ₃	CH ₃	H	4-Cl	3-Cl	0	²⁰ n _D 1.5905
316	CH ₃	CH ₃	H	4-Cl	4-Cl	0	²⁰ n _D 1.5785
317	CH ₃	CH ₃	H	4-Cl	4-Cl	S	m.p. 96.7
318	CH ₃	CH ₃	H	4-Cl	4-Cl	SO	²⁰ n _D 1.5569
319	CH ₃	CH ₃	H	4-Cl	4-Cl	SO ₂	²⁰ n _D 1.5642
320	CH ₃	CH ₃	H	4-Cl	2,4-Cl ₂	0	m.p. 117.9
321	CH ₃	CH ₃	H	4-Cl	4-OCH ₃	0	²⁰ n _D 1.5809
322	CH ₃	CH ₃	H	4-Cl	4-O-C(=O)-C(F) ₃	0	m.p. 97.8
323	CH ₃	CH ₃	H	2,4-Cl ₂	4-Cl	0	²⁰ n _D 1.5811
324	CH ₃	CH ₃	H	3,4-Cl ₂	4-Cl	0	²⁰ n _D 1.5958
325	CH ₃	CH ₃	H	2,5-Cl ₂	4-Cl	0	²⁰ n _D 1.5826
326	CH ₃	CH ₃	H	3,5-Cl ₂	4-Cl	0	²⁰ n _D 1.5778
327	CH ₃	CH ₃	H	2,6-Cl ₂	4-Cl	0	²⁰ n _D 1.5825
328	CH ₃	CH ₃	H	4-Br	H	0	²⁰ n _D 1.5878
329	CH ₃	CH ₃	H	4-Br	4-Cl	0	²⁰ n _D 1.5972
330	CH ₃	CH ₃	H	4-I	4-Cl	0	²⁰ n _D 1.6131

- Cont'd -

Table 1(a) (Cont'd)

331	CH ₃	CH ₃	H	4-CN	H	H	n _D ²⁰	1.5882
332	CH ₃	CH ₃	H	4-NO ₂	H	H	n _D ²⁰	1.5942
333	CH ₃	CH ₃	H	4-Si(CH ₃) ₃	H	H	m.p.	50.8
334	CH ₃	CH ₃	CH ₃	4-Si(CH ₃) ₃	H	H	m.p.	61.2
335	CH ₃	CH ₃	H	4-OH	H	H	m.p.	>300
336	CH ₃	CH ₃	H	4-OCH ₃	H	H	n _D ²⁰	1.5739
337	CH ₃	CH ₃	H	4-OCHF ₂	H	H	n _D ²⁰	1.5422
338	CH ₃	CH ₃	H	4-OCHF ₂	H	H	s	n _D ²⁰ 1.5772
339	CH ₃	CH ₃	H	4-OCHF ₂	H	H	so	n _D ²⁰ 1.5583
340	CH ₃	CH ₃	H	4-OCHF ₂	4-CH ₃		n _D ²⁰	1.5745
341	CH ₃	CH ₃	H	4-OCHF ₂	4-C ₄ H ₉ -t		n _D ²⁰	1.5396
342	CH ₃	CH ₃	H	4-OCHF ₂	4-F		n _D ²⁰	1.5455
343	CH ₃	CH ₃	H	4-OCHF ₂	3-Cl		n _D ²⁰	1.5630
344	CH ₃	CH ₃	H	4-OCHF ₂	4-Cl		n _D ²⁰	1.5584
345	CH ₃	CH ₃	H	4-OCHF ₂	3,4-Cl ₂		n _D ²⁰	1.5460
346	CH ₃	CH ₃	H	4-OCHF ₂	4-OCH ₃		n _D ²⁰	1.5462

- Cont'd -

Table 1(a) (Cont'd)

347	CH ₃	CH ₃	H	4-OCF ₃	H		O	n _D ²⁰ 1.5386
348	CH ₃	CH ₃	H	4-OCF ₃	H		S	n _D ²⁰ 1.5510
349	CH ₃	CH ₃	H	4-OCF ₃		3-C1	O	n _D ²⁰ 1.5399
350	CH ₃	CH ₃	H	4-OCF ₃		4-C1	O	n _D ²⁰ 1.5244
351	CH ₃	CH ₃	H	4-OC ₂ H ₅		H	O	n _D ²⁰ 1.5736
352	CH ₃	CH ₃	H	4-OC ₂ H ₅		4-C1	O	n _D ²⁰ 1.5744
353	CH ₃	CH ₃	H	4-OCF ₂ CHF ₂		H	O	n _D ²⁰ 1.5287
354	CH ₃	CH ₃	C ₂ H ₅	4-OCF ₂ CHF ₂		H	O	n _D ²⁰ 1.5252
355	CH ₃	CH ₃	H	4-OCF ₂ CHF ₂		2-F	O	n _D ²⁰ 1.5130
356	CH ₃	CH ₃	H	4-OCF ₂ CHF ₂		4-F	O	n _D ²⁰ 1.5242
357	CH ₃	CH ₃	H	4-OCF ₂ CHF ₂		4-C1	O	m.p. 83.8
358	CH ₃	CH ₃	H	4-OCF ₂ CHF ₂		4-OC ₂ H ₃	O	n _D ²⁰ 1.5300
359	CH ₃	CH ₃	H	4-OC ₃ H _{7-i}		H	O	n _D ²⁰ 1.5686
360	CH ₃	CH ₃	H	4-OC ₃ H _{7-i}		4-F	O	n _D ²⁰ 1.5665
361	CH ₃	CH ₃	H	4-OC ₃ H _{7-i}		4-C1	O	n _D ²⁰ 1.5689
362	CH ₃	CH ₃	H	4-OC ₃ H _{9-i}		4-OC ₂ H ₃	O	n _D ²⁰ 1.5642

- Cont'd -

Table 1(a) (Cont'd)

363	CH ₃	CH ₃	H	4-OC ₄ H ₉ -t	H	n _D ²⁰ 1.5562
364	CH ₃	CH ₃	H	4-OC ₄ H ₉ -t	4-F	n _D ²⁰ 1.5682
365	CH ₃	CH ₃	H	4-OC ₄ H ₉ -t	4-Cl	m.p. 89.4
366	CH ₃	CH ₃	H	4-OC ₄ H ₉ -t	4-OCH ₃	n _D ²⁰ 1.5663
367	CH ₃	CH ₃	H	3-O-C ₆ H ₄ -O-	H	n _D ²⁰ 1.5896
368	CH ₃	CH ₃	H	3-O-C ₆ H ₄ -O-	2,4-Cl ₂	0
369	CH ₃	CH ₃	H	4-O-C ₆ H ₄ -O-	H	n _D ²⁰ 1.5586
370	CH ₃	CH ₃	H	4-O-C ₆ H ₄ -O-	4-F	n _D ²⁰ 1.5945
371	CH ₃	CH ₃	H	4-O-C ₆ H ₄ -O-	4-Cl	n _D ²⁰ 1.5852
372	CH ₃	CH ₃	H	Cl-C ₆ H ₄ -O-	H	n _D ²⁰ 1.5921
373	CH ₃	CH ₃	H	4-O-C ₆ H ₄ -N=C(F) ₃	H	n _D ²⁰ 1.5640
				3,4(-OCH ₂ O-)	H	n _D ²⁰ 1.5850

- Cont'd -

Table 1(a) (Cont'd)

374	CH ₃	CH ₃	H	3,4 (-OCH ₂ O-)	4-F	0	n _D ²⁰ 1.5750
375	CH ₃	CH ₃	H	3,4 (-OCH ₂ O-)	4-Cl	0	n _D ²⁰ 1.5867
376	CH ₃	CH ₃	H	4-OCHCOOC ₂ H ₅	CH ₃	0	n _D ²⁰ 1.5505
377	CH ₃	CH ₃	H	4-OCHCOOC ₃ H ₇ -i	CH ₃	0	n _D ²⁰ 1.5447
378	CH ₃	CH ₃	H	4-OCHCOOC ₂ H ₅	CH ₃	0	n _D ²⁰ 1.5560
379	CH ₃	CH ₃	H	4-OCHCOOC ₂ H ₅	CH ₃	0	n _D ²⁰ 1.5600
380	CH ₃	CH ₃	H	4-OCHCOOC ₂ H ₅	CH ₃	0	n _D ²⁰ 1.5431
381	CH ₃	CH ₃	H	4-OCHCOOC ₃ H ₇ -i	CH ₃	0	n _D ²⁰ 1.5480
382	CH ₃	CH ₃	H	4-OCHCOOC ₄ H ₉ -t	CH ₃	0	n _D ²⁰ 1.5408

- Cont'd -

Table 1(a) (Cont'd)

383	CH ₃	CH ₃	H	CH ₃ 4-OCHCOOC ₄ H ₉ -t	4-F	O	n _D ²⁰ 1.5300
384	CH ₃	CH ₃	H	CH ₃ 4-OCHCOOC ₄ H ₉ -t C ₃ H ₇ -i	4-OCH ₃	O	n _D ²⁰ 1.5380
385	CH ₃	CH ₃	H	CH ₃ 4-OCHCOOC ₂ H ₅	H	O	n _D ²⁰ 1.5448
386	CH ₃	CH ₃	H	CH ₃ 4-OCCOOC ₂ H ₅	H	O	n _D ²⁰ 1.5553
387	CH ₃	CH ₃	H	CH ₃ 4-OCCOOC ₃ H ₇ -i	H	O	n _D ²⁰ 1.5522
388	CH ₃	CH ₃	H	CH ₃ 4-OCH ₂ 	H	O	n _D ²⁰ 1.5565
389	CH ₃	CH ₃	H	CH ₃ 4-OSiC ₄ H ₉ -t CH ₃	H	O	n _D ²⁰ 1.5423

- Cont'd -

Table 1(a) (Cont'd)

		H		m.p.	81.8
390	CH ₃	CH ₃	4-SCH ₃		
391	CH ₃	CH ₃	4-SCH ₃	n _D ²⁰	1.5930
392	CH ₃	CH ₃	4-SCH ₃	n _D ²⁰	1.5955
393	CH ₃	CH ₃	4-SCH ₃	n _D ²⁰	1.5995
394	CH ₃	CH ₃	4-SOCH ₃	n _D ²⁰	1.5865
395	CH ₃	CH ₃	4-SOCH ₃	n _D ²⁰	1.5700
396	CH ₃	CH ₃	4-SOCH ₃	n _D ²⁰	1.5908
397	CH ₃	CH ₃	4-SOCH ₃	n _D ²⁰	1.5864
398	CH ₃	CH ₃	4-SO ₂ CH ₃	n _D ²⁰	1.5745
399	CH ₃	CH ₃	4-SO ₂ CH ₃	n _D ²⁰	1.5658
400	CH ₃	CH ₃	4-SO ₂ CH ₃	n _D ²⁰	1.5672
401	CH ₃	CH ₃	4-SO ₂ CH ₃	n _D ²⁰	1.5866
402	CH ₃	CH ₃	4-SC ₂ H ₅	n _D ²⁰	1.6026
403	CH ₃	CH ₃	4-SC ₂ H ₅	n _D ²⁰	1.5940
404	CH ₃	CH ₃	4-SOC ₂ H ₅	n _D ²⁰	1.5899
405	CH ₃	CH ₃	4-SOC ₂ H ₅	n _D ²⁰	1.5740

- Cont'd -

Table 1(a) (Cont'd)

406	CH ₃	CH ₃	H	4-SO ₂ C ₂ H ₅	H			0	m.p. 118.9
407	CH ₃	CH ₃	H	4-SO ₂ C ₂ H ₅	4-F			0	n _D ²⁰ 1.5891
408	CH ₃	CH ₃	H	2-SC ₃ H ₇ -i, 5-CH ₃	H			0	n _D ²⁰ 1.5830
409	CH ₃	CH ₃	H	4-SC ₃ H ₇ -i	H			0	n _D ²⁰ 1.5902
410	CH ₃	CH ₃	H	2-SC ₃ H ₇ -i	H			0	n _D ²⁰ 1.5872
411	CH ₃	CH ₃	H	4-SC ₃ H ₇ -i	4-F			0	n _D ²⁰ 1.5752
412	CH ₃	CH ₃	H	4-SC ₃ H ₇ -i	4-Cl			0	n _D ²⁰ 1.5928
413	CH ₃	CH ₃	H	4-SC ₃ H ₇ -i	4-OCH ₃			0	n _D ²⁰ 1.5862
414	CH ₃	CH ₃	H	4-SOC ₃ H ₇ -i	H			0	n _D ²⁰ 1.5802
415	CH ₃	CH ₃	H	4-SOC ₃ H ₇ -i	4-F			0	n _D ²⁰ 1.5669
416	CH ₃	CH ₃	H	4-SOC ₃ H ₇ -i	4-Cl			0	n _D ²⁰ 1.5810
417	CH ₃	CH ₃	H	4-SOC ₃ H ₇ -i	4-OCH ₃			0	n _D ²⁰ 1.5748
418	CH ₃	CH ₃	H	4-SO ₂ C ₃ H ₇ -i	H			0	n _D ²⁰ 1.5626
419	CH ₃	CH ₃	H	4-SO ₂ C ₃ H ₇ -i	4-F			0	n _D ²⁰ 1.5594
420	CH ₃	CH ₃	H	4-SO ₂ C ₃ H ₇ -i	4-OCH ₃			0	n _D ²⁰ 1.5652

- Cont'd -

Table 1(a) (Cont'd)

421	CH ₃	CH ₃	H	4-SC ₄ H ₉ -t	H			
422	CH ₃	CH ₃	H	4-SCHF ₂	H			
423	CH ₃	CH ₃	H	4-SCHF ₂	H			
424	CH ₃	CH ₃	CH ₃	4-SCHF ₂	H			
425	C ₂ H ₅	CH ₃	H	4-SCHF ₂	H			
426	CH ₃	CH ₃	○	4-SCHF ₂	H			
427	CH ₃	CH ₃	H	4-SCHF ₂	2-CH ₃	0		
428	CH ₃	CH ₃	H	4-SCHF ₂	3-CH ₃	0		
429	CH ₃	CH ₃	H	4-SCHF ₂	4-CH ₃	0		
430	CH ₃	CH ₃	H	4-SCHF ₂	4-C ₄ H ₉ -t	0		
431	CH ₃	CH ₃	H	4-SCHF ₂	4-F	0		
432	CH ₃	CH ₃	H	4-SCHF ₂	2-Cl	0		
433	CH ₃	CH ₃	H	4-SCHF ₂	3-Cl	0		
434	CH ₃	CH ₃	H	4-SCHF ₂	4-Cl	0		
435	CH ₃	CH ₃	H	4-SCHF ₂	3,4-Cl ₂	0		
					n _D ²⁰ 1.5917			
					n _D ²⁰ 1.5853			
					n _D ²⁰ 1.5733			
					n _D ²⁰ 1.6056			
					n _D ²⁰ 1.5482			
					n _D ²⁰ 1.5659			

- Cont'd -

Table 1(a) (Cont'd)

436	CH ₃	CH ₃	H	4-SCHF ₂	4-Br	n _D ²⁰ 1.5855
437	CH ₃	CH ₃	H	4-SCHF ₂	4-OCH ₃	n _D ²⁰ 1.5694
438	CH ₃	CH ₃	H	4-SOCHF ₂	H	n _D ²⁰ 1.5575
439	CH ₃	CH ₃	H	4-SOCHF ₂	4-F	Paste
440	CH ₃	CH ₃	H	4-SOCHF ₂	4-Cl	n _D ²⁰ 1.5748
441	CH ₃	CH ₃	H	4-SOCHF ₂	4-Br	n _D ²⁰ 1.5768
442	CH ₃	CH ₃	H	4-SOCHF ₂	4-OCH ₃	n _D ²⁰ 1.5704
443	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	H	n _D ²⁰ 1.5765
444	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	4-F	n _D ²⁰ 1.5500
445	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	4-Cl	n _D ²⁰ 1.5612
446	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	4-Br	n _D ²⁰ 1.5643
447	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	4-OCH ₃	n _D ²⁰ 1.5597
448	CH ₃	CH ₃	H	4-SOF ₂ Br	H	n _D ²⁰ 1.5801
449	CH ₃	CH ₃	H	4-SCF ₂ Br	4-F	m.p. 82.3
450	CH ₃	CH ₃	H	4-SCF ₂ CFC1 ₂	H	n _D ²⁰ 1.5557

- Cont'd -

Table 1(a) (Cont'd)

451	CH ₃	CH ₃	H	4-SO ₂ CF ₂ CFCl ₂	4-F	0	n _D	1.5557
452	CH ₃	CH ₃	H	4-SO ₂ CF ₂ CFCl ₂	4-Cl	0	n _D	1.5676
453	CH ₃	CH ₃	H	4-SO ₂ CF ₂ CFCl ₂	4-OCH ₃	0	n _D	1.5640
454	CH ₃	CH ₃	H	4-SO ₂ CF ₂ CFCl ₂	H	0	n _D	1.5889
455	CH ₃	CH ₃	H	4-SO ₂ CF ₂ CFCl ₂	H	0	n _D	1.5958
456	CH ₃	CH ₃	H	4-SCH ₂ CF ₃	H	0	n _D	1.5722
457	CH ₃	CH ₃	H	4-SCH ₂ CF ₃	4-F	0	n _D	1.5569
458	CH ₃	CH ₃	H	4-SCH ₂ CF ₃	4-Cl	0	n _D	1.5732
459	CH ₃	CH ₃	H	4-SCH ₂ CF ₃	4-OCH ₃	0	n _D	1.5568
460	CH ₃	CH ₃	H	4-SOCH ₂ CF ₃	4-F	0	n _D	1.5501
461	CH ₃	CH ₃	H	4-SOCH ₂ CF ₃	4-Cl	0	n _D	1.5620
462	CH ₃	CH ₃	H	4-SOCH ₂ CF ₃	4-OCH ₃	0	n _D	1.5518
463	CH ₃	CH ₃	H	4-SO ₂ CH ₂ CF ₃	4-F	0	n _D	1.5449
464	CH ₃	CH ₃	H	4-SO ₂ CH ₂ CF ₃	4-Cl	0	n _D	1.5497
465	CH ₃	CH ₃	H	4-SO ₂ CHF ₂	H	0	n _D	1.5527

- Cont'd -

Table 1 (a) (Cont'd)

466	CH ₃	CH ₃	4-SCF ₂ CHF ₂	H	n _D ²⁰	1.5514
467	CH ₃	CH ₃	4-SCF ₂ CHF ₂	2-F	n _D ²⁰	1.5462
468	CH ₃	CH ₃	4-SCF ₂ CHF ₂	3-F	n _D ²⁰	1.5450
469	CH ₃	CH ₃	4-SCF ₂ CHF ₂	4-F	n _D ²⁰	1.5536
470	CH ₃	CH ₃	4-SCF ₂ CHF ₂	2-Cl	n _D ²⁰	1.5540
471	CH ₃	CH ₃	4-SCF ₂ CHF ₂	4-Cl	n _D ²⁰	1.5636
472	CH ₃	CH ₃	4-SCF ₂ CHF ₂	2-OCH ₃	n _D ²⁰	1.5547
473	CH ₃	CH ₃	4-SCF ₂ CHF ₂	3-OCH ₃	n _D ²⁰	1.5541
474	CH ₃	CH ₃	4-SCF ₂ CHF ₂	4-OCH ₃	n _D ²⁰	1.5645
475	CH ₃	CH ₃	4-SCF ₂ CHF ₂	3,5-(OCH ₃) ₂	n _D ²⁰	1.5477
476	CH ₃	CH ₃	4-SOCF ₂ CHF ₂	H	n _D ²⁰	1.5865
477	CH ₃	CH ₃	4-SOCF ₂ CHF ₂	4-F	n _D ²⁰	1.5684
478	CH ₃	CH ₃	4-SOCF ₂ CHF ₂	4-Cl	n _D ²⁰	1.5498
479	CH ₃	CH ₃	4-SOCF ₂ CHF ₂	4-OCH ₃	n _D ²⁰	1.5786
480	CH ₃	CH ₃	4-SO ₂ CF ₂ CHF ₂	4-F	Paste	

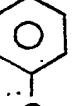
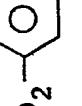
- Cont'd -

Table 1 (a). (Cont'd)

			Paste
481	CH ₃	H	H
482	CH ₃	CH ₃	4-Cl
483	CH ₃	CH ₃	4-OCH ₃
484	CH ₃	CH ₃	H
485	CH ₃	CH ₃	4-F
486	CH ₃	CH ₃	4-Cl
487	CH ₃	CH ₃	4-OCH ₃
488	CH ₃	CH ₃	H
489	CH ₃	CH ₃	4-F
490	CH ₃	CH ₃	4-F
491	CH ₃	CH ₃	4-Cl
492	CH ₃	CH ₃	4-OCH ₃
493	CH ₃	CH ₃	H
494	CH ₃	CH ₃	H
495	CH ₃	CH ₃	4-CH ₃
			20 nD 1.5420
			20 nD 1.5890
			20 nD 1.5632
			20 nD 1.5585
			20 nD 1.5655
			20 nD 1.5622
			20 nD 1.5680
			20 nD 1.5503
			20 nD 1.5686
			20 nD 1.5611
			20 nD 1.5588
			20 nD 1.5250
			20 nD 1.5217
			20 nD 1.5228

- Cont'd -

Table 1(a) (Cont'd)

496	CH ₃	CH ₃	H	4-SC ₃ F ₇	3-F	n _D ²⁰	1.5172
497	CH ₃	CH ₃	H	4-SC ₃ F ₇	4-F	n _D ²⁰	1.5175
498	CH ₃	CH ₃	H	4-SC ₃ F ₇	3-Cl	n _D ²⁰	1.5298
499	CH ₃	CH ₃	H	4-SC ₃ F ₇	4-Cl	Paste	
500	CH ₃	CH ₃	H	4-SC ₃ F ₇		n _D ²⁰	1.5020
501	CH ₃	CH ₃	H	4-SC ₃ F ₇	3-CF ₃	n _D ²⁰	1.5263
502	CH ₃	CH ₃	H	4-SC ₃ F ₇	3-OCH ₃	n _D ²⁰	1.5137
503	CH ₃	CH ₃	H	4-SC ₃ F ₇	4-OCH ₃	n _D ²⁰	1.5289
504	CH ₃	CH ₃	H	4-SOC ₃ F ₇	H	Paste	
505	CH ₃	CH ₃	H	4-SOC ₃ F ₇	4-F	n _D ²⁰	1.6134
506	CH ₃	CH ₃	H	4-SO ₂ - 	H	n _D ²⁰	1.5980
507	CH ₃	CH ₃	H	4-SO ₂ - 	H	n _D ²⁰	1.5940
508	CH ₃	CH ₃	H	4-SO ₂ - 	H	n _D ²⁰	1.6052
509	CH ₃	CH ₃	H	4-Cl			

- Cont'd -

Table 1 (a) (Cont'd)

510	CH ₃	CH ₃	H	4-SOCHF ₂	4-Cl	n _D ²⁰ 1.5643
511	CH ₃	CH ₃	H	4-SCF ₃	H	n _D ²⁰ 1.5320
512	CH ₃	CH ₃	H	4-SOCF ₃	H	n _D ²⁰ 1.5324
513	CH ₃	CH ₃	H	4-SO ₂ CF ₃	H	n _D ²⁰ 1.5876
514	CH ₃	CH ₃	H	4-SC ₃ F ₇	4-OCHF ₂	n _D ²⁰ 1.5235
515	CH ₃	CH ₃	H	4-SC ₃ F ₇	4-OCF ₃	n _D ²⁰ 1.5201
516	CH ₃	CH ₃	H	4-COSC ₂ H ₅	H	n _D ²⁰ 1.5889
517	CH ₃	CH ₃	H	4-COSC ₃ H ₇ -i	H	n _D ²⁰ 1.5812
518	CH ₃	CH ₃	H	4-COSC ₄ H ₉ -t	H	n _D ²⁰ 1.5896
519	CH ₃	CH ₃	H	4-CONHCH ₃	H	Crystal
520	CH ₃	CH ₃	H	4-CONHCH ₃	4-F	n _D ²⁰ 1.5576
521	CH ₃	CH ₃	H	4-CONHC ₃ H ₇ -i	H	m.p. 94.4
522	CH ₃	CH ₃	H	4-CONHC ₃ H ₇ -i	4-F	m.p. 136.4
523	CH ₃	CH ₃	H	4-CONHC ₄ H ₉ -t	H	m.p. 106.7
524	CH ₃	CH ₃	H	4-CONHC ₄ H ₉ -t	4-F	n _D ²⁰ 1.5582

- Cont'd -

Table 1(a) (Cont'd)

525	CH ₃	CH ₃	H	4-CONHCO ₂ H _{9-t}	4-OCH ₃	²⁰ n _D 1.5662
526	CH ₃	CH ₃	H	4-CON(CH ₃) ₂	H	²⁰ n _D 1.5808
527	CH ₃	CH ₃	H	4-CON(C ₃ H _{7-i}) ₂	H	²⁰ n _D 1.5263
528	CH ₃	CH ₃	H	4-CON(C ₃ H _{7-i}) ₂	4-F	²⁰ n _D 1.5245
529	CH ₃	CH ₃	H	4-CON(C ₃ H _{7-i}) ₂	4-Cl	²⁰ n _D 1.5326
530	CH ₃	CH ₃	H	4-CON(C ₃ H _{7-i}) ₂	4-OCH ₃	²⁰ n _D 1.5328
531	CH ₃	CH ₃	H	4-CON(CH ₃) Cyclohexyl	H	²⁰ n _D 1.5803
532	CH ₃	CH ₃	H	4-CONCyclohexyl	H	²⁰ n _D 1.5689
533	CH ₃	CH ₃	H	4-CONCyclohexyl	4-F	²⁰ n _D 1.5755
534	CH ₃	CH ₃	H	4-CONCyclohexyl	4-Cl	²⁰ n _D 1.5657
535	CH ₃	CH ₃	H	4-CONCyclohexyl	4-OCH ₃	Paste
						- Cont'd -

Table 1 (a) (Cont'd)

536	CH ₃	CH ₃	H	4-COCONC ₄ H ₉	H		0	²⁰ n _D	1.5632
537	CH ₃	CH ₃	H	4-COCONC ₄ H ₉	4-F		0	²⁰ n _D	1.5600
538	CH ₃	CH ₃	H	4-COCONC ₄ H ₉	4-OCH ₃		0	²⁰ n _D	1.5498
539	CH ₃	CH ₃	H	4-COCONC ₄ H ₉	H		0	²⁰ n _D	1.5617
540	CH ₃	CH ₃	H	4-COCONC ₄ H ₉	4-F		0	n	1.5643
541	CH ₃	CH ₃	H	4-COCH ₃	H		0	m.p.	88.0
542	CH ₃	CH ₃	H	4-COCOOCH ₂ C ₂ H ₅	H		0	²⁰ n _D	1.5709
543	CH ₃	CH ₃	H	4-COCOOCH ₃	H ₇ -i		0	²⁰ n _D	1.5756
544	CH ₃	CH ₃	H	4-COC ₂ H ₅	H		0	m.p.	59.0
545	CH ₃	CH ₃	H	4-COC ₂ H ₅	4-F		0	²⁰ n _D	1.5664

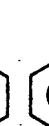
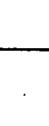
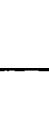
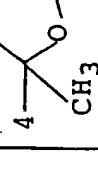
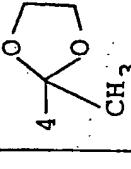
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Table 1(a) (Cont'd)

546	CH ₃	CH ₃	H	4-COC ₃ H ₇ -i	H		²⁰ n _D 1.5705
547	CH ₃	CH ₃	H	4-COC ₄ H ₉ -t	H		²⁰ n _D 1.5853
548	CH ₃	CH ₃	H	4-COC ₄ H ₉ -t	4-F		²⁰ n _D 1.5567
549	CH ₃	CH ₃	H	4-COC ₄ H ₉ -t	4-Cl		²⁰ n _D 1.5896
550	CH ₃	CH ₃	H	4-CO-C-CN	H		²⁰ n _D 1.5865
				CH ₃			
				CH ₃			
551	CH ₃	CH ₃	H	4-COC-COOCH ₃	H		²⁰ n _D 1.5630
				CH ₃			
552	CH ₃	CH ₃	H	4-CO-	H		²⁰ n _D 1.5941
553	CH ₃	CH ₃	H	4-CO-	4-Cl		²⁰ n _D 1.5850
554	CH ₃	CH ₃	H	4-CO-	H		²⁰ n _D 1.5952
				Cl			

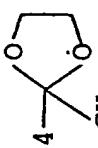
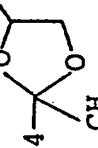
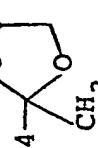
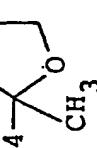
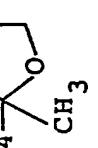
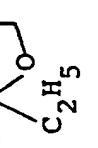
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Table 1(a) (Cont'd)

555	CH ₃	CH ₃	H	4-CO-  -Cl	4-F	0	²⁰ n _D	1.5935
556	CH ₃	CH ₃	H	4-CO-  -Cl	4-Cl	0	²⁰ n _D	1.5967
557	CH ₃	CH ₃	H	4-CO-  -Cl	4-OCH ₃	0	²⁰ n _D	1.5937
558	CH ₃	CH ₃	H	4-CO-  -C ₄ H ₉ -t	H	0	²⁰ n _D	1.5764
559	CH ₃	CH ₃	H	4-CO-  -C ₄ H ₉ -t	4-F	0	²⁰ n _D	1.5643
560	CH ₃	CH ₃	H	4-CO-  -C ₄ H ₉ -t	4-Cl	0	²⁰ n _D	1.5830
561	CH ₃	CH ₃	H	4-CO-  -C ₄ H ₉ -t	4-OCH ₃	0	²⁰ n _D	1.5782
562	CH ₃	CH ₃	H		H	0	²⁰ n _D	1.5698
563	CH ₃	CH ₃	H		4-F	0	²⁰ n _D	1.5555

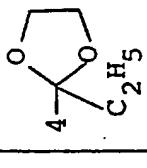
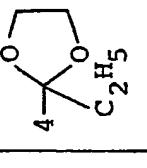
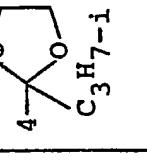
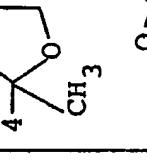
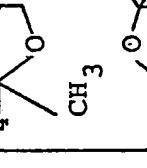
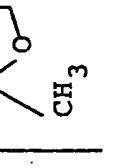
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Table 1(a) (Cont'd)

564	CH ₃	CH ₃	H		4-Cl	0	n_D^{20} 1.5569
565	CH ₃	CH ₃	H		H	0	n_D^{20} 1.5619
566	CH ₃	CH ₃	H		4-F	0	Paste
567	CH ₃	CH ₃	H		4-Cl	0	n_D^{20} 1.5689
568	CH ₃	CH ₃	H		4-OCH ₃	0	n_D^{20} 1.5593
569	CH ₃	CH ₃	H		H	0	n_D^{20} 1.5630

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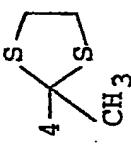
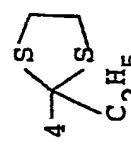
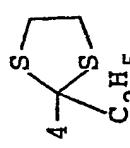
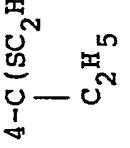
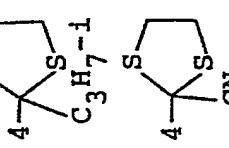
Table 1 (a) (Cont'd)

570	CH ₃	CH ₃	H		4-F	n _D ²⁰	1.5472
571	CH ₃	CH ₃	H		4-OCH ₃	n _D ²⁰	1.5623
572	CH ₃	CH ₃	H		H	n _D ²⁰	1.5560
573	CH ₃	CH ₃	H		H	n _D ²⁰	1.5526
574	CH ₃	CH ₃	H		4-F	n _D ²⁰	1.5656
575	CH ₃	CH ₃	H		4-OCH ₃	n _D ²⁰	1.5123

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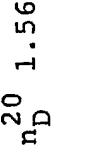
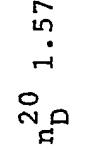
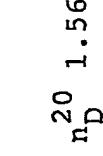
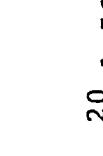
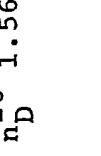
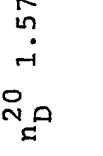
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Table 1 (a) (Cont'd)

576	CH ₃	CH ₃	H		H	0	n _D ²⁰ 1.6188
577	CH ₃	CH ₃	H		H	0	n _D ²⁰ 1.6089
578	CH ₃	CH ₃	H		4-F	0	n _D ²⁰ 1.5978
579	CH ₃	CH ₃	H		H	0	n _D ²⁰ 1.5831
580	CH ₃	CH ₃	H		H	0	n _D ²⁰ 1.5952
581	CH ₃	CH ₃	H			0	Paste

- Cont'd -

Table 1(a) (Cont'd)

582	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5665
583	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5685
584	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5748
585	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5623
586	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5682
587	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5768
588	CH ₃	CH ₃	H		H	n_{D}^{20}	1.5620

- Cont'd -

Table 1 (a) (Cont'd)

589	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{CHO} \end{array}$	H		0	m.P. 105.3
590	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOCH}_3 \end{array}$	H		0	n_D^{20} 1.5808
591	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOCH}_2\text{CH}_2\text{OCH}_3 \end{array}$	H		0	n_D^{20} 1.5705
592	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOCH}_2\text{CH}_2\text{OCH}_3 \end{array}$	4-F		0	n_D^{20} 1.5621
593	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOCH}_2\text{CH}_2\text{OCH}_3 \end{array}$	4-OCH ₃		0	n_D^{20} 1.5659
594	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOC}_3\text{H}_7-\text{i} \end{array}$	H		0	m.P. 115.2
595	CH ₃	CH ₃	H	$\begin{array}{c} \text{H} \\ \\ 4-\text{N} \swarrow \text{COOC}_3\text{H}_7-\text{i} \end{array}$	4-F		0	n_D^{20} 1.5645
596	CH ₃	CH ₃	H	$\begin{array}{c} \text{CH}_3 \\ \\ 2-\text{N} \swarrow \text{COOCH}_3 \end{array}$	H		0	Paste

- Cont'd -

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Table 1(a) (Cont'd)

597	CH ₃	CH ₃	H	2-N<sup>CH</sub> ₃ COOCH ₃	4-F	0	n<sup>20</sub> _D 1.5561
598	CH ₃	CH ₃	H	2-N<sup>CH</sub> ₃ COOCH ₃	4-OCH ₃	0	n<sup>20</sub> _D 1.5599
599	CH ₃	CH ₃	H	3-N<sup>CH</sub> ₃ COOCH ₃	H	0	n<sup>20</sub> _D 1.5764
600	CH ₃	CH ₃	H	3-N<sup>CH</sub> ₃ COOCH ₃	4-F	0	n<sup>20</sub> _D 1.5685
601	CH ₃	CH ₃	H	3-N<sup>CH</sub> ₃ COOCH ₃	4-OCH ₃	0	n<sup>20</sub> _D 1.5723
602	CH ₃	CH ₃	H	4-N<sup>CH</sub> ₃ COOCH ₃	H	0	Paste
603	CH ₃	CH ₃	H	4-N<sup>CH</sub> ₃ COOCH ₃	4-F	0	Paste
604	CH ₃	CH ₃	H	4-N<sup>CH</sub> ₃ COOCH ₂ CH ₂ OCH ₃	H	0	n<sup>20</sub> _D 1.5683

- Cont'd -

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Table 1(a) (Cont'd)

605	CH ₃	CH ₃	H	3-N<CH ₃ COOC ₃ H ₇ -n	H	0	n _D ²⁰	1.5662
606	CH ₃	CH ₃	H	3-N<CH ₃ COOC ₃ H ₇ -n	4-F	0	n _D ²⁰	1.5582
607	CH ₃	CH ₃	H	3-N<CH ₃ COOC ₃ H ₇ -n	4-OCH ₃	0	n _D ²⁰	1.5625
608	CH ₃	CH ₃	H	4-N<CH ₃ COOC ₃ H ₇ -n	H	0	n _D ²⁰	1.5564
609	CH ₃	CH ₃	H	4-N<CH ₃ COOC ₃ H ₇ -n	4-F	0	n _D ²⁰	1.5559
610	CH ₃	CH ₃	H	4-N<CH ₃ COOC ₃ H ₇ -n	4-Cl	0	n _D ²⁰	1.5595
611	CH ₃	CH ₃	H	4-N<CH ₃ COOC ₃ H ₇ -n	4-OCH ₃	0	n _D ²⁰	1.5557
612	CH ₃	CH ₃	H	4-N<CH ₃ COOC ₃ H ₇ -i	H	0	n _D ²⁰	1.5648

- Cont'd -

Table 1 (a) (Cont'd)

613	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_3\text{H}_7-\text{i} \end{cases}$	4-F	0	n_{D}^{20}	1.5529
614	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_4\text{H}_9-\text{i} \end{cases}$	H	0	n_{D}^{20}	1.5582
615	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_4\text{H}_9-\text{i} \end{cases}$	4-F	0	n_{D}^{20}	1.5421
616	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_4\text{H}_9-\text{i} \end{cases}$	4-Cl	0	n_{D}^{20}	1.5573
617	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_4\text{H}_9-\text{i} \end{cases}$	4-OCH ₃	0	n_{D}^{20}	1.5538
618	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{CH}_3 \\ \text{COOC}_4\text{H}_9-\text{i} \end{cases}$	3,4(-OCH ₂ O-)	0	n_{D}^{20}	1.5621
619	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_3 \end{cases}$	H	0	n_{D}^{20}	1.5638
620	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_3 \end{cases}$	4-F	0	Paste	
						- Cont'd -		

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Table 1(a) (Cont'd)

621	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_3 \end{cases}$	4-OCH ₃	0	n_D^{20} 1.5656
622	CH ₃	CH ₃	CH ₃	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_3 \end{cases}$	H	0	m.p. 83.4
623	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_2\text{CH}_2\text{Cl} \end{cases}$	H	0	n_D^{20} 1.5706
624	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_2\text{CH}_2\text{Cl} \end{cases}$	4-F	0	Paste
625	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOCH}_2\text{CH}_2\text{Cl} \end{cases}$	4-OCH ₃	0	n_D^{20} 1.5695
626	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOC}_3\text{H}_7-n \end{cases}$	H	0	n_D^{20} 1.5605
627	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOC}_3\text{H}_7-n \end{cases}$	4-F	0	n_D^{20} 1.5532
628	CH ₃	CH ₃	H	$4-\text{N} \begin{cases} \text{C}_2\text{H}_5 \\ \text{COOC}_3\text{H}_7-n \end{cases}$	4-OCH ₃	0	n_D^{20} 1.5602

- Cont'd -

Table 1 (a) (Cont'd)

629	CH ₃	CH ₃	H	$4-N<C_2H_5$	H		
630	CH ₃	CH ₃	H	$4-N<C_2H_5$	4-F		
631	CH ₃	CH ₃	H	$4-N<C_2H_5$	4-OCH ₃		
632	CH ₃	CH ₃	H	$4-N<C_2H_5$	H		
633	CH ₃	CH ₃	H	$4-N<C_2H_5$	4-F		
634	CH ₃	CH ₃	H	$4-N<C_2H_5$	H		
635	CH ₃	CH ₃	H	$4-N<C_2H_5$	4-F		
						n _D ²⁰ 1.5549	
						n _D ²⁰ 1.5448	
						n _D ²⁰ 1.5513	
						n _D ²⁰ 1.5689	
						n _D ²⁰ 1.5701	
						n _D ²⁰ 1.5481	
						n _D ²⁰ 1.5415	

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- Cont'd -

Table 1 (a) (Cont'd)

636	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	H		O	m.p. 73.3
637	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	4-F		O	n_D^{20} 1.5685
638	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	4-OCH ₃		O	n_D^{20} 1.5710
639	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	H		O	n_D^{20} 1.5520
640	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	4-F		O	Paste
641	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	4-OCH ₃		O	n_D^{20} 1.5610
642	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	H		O	n_D^{20} 1.5516
643	CH ₃	CH ₃	H	$\text{C}_3\text{H}_7-\text{i}$	4-F		O	n_D^{20} 1.5489
							- Cont'd -	

Table 1 (a) (Cont'd)

644	CH ₃	CH ₃	H	4-N_iC₃H₇-i COOC₃H₇-n	4-OCH ₃	O	n_D ²⁰ 1.5542
645	CH ₃	CH ₃	H	4-N_iC₃H₇-i COOC₃H₇-i	H	O	n_D ²⁰ 1.5545
646	CH ₃	CH ₃	H	4-N_iC₃H₇-i COOC₃H₇-i	4-F	O	n_D ²⁰ 1.5448
647	CH ₃	CH ₃	H	4-N_iC₂H₅ COC₄H₉-t	H	O	Paste
648	CH ₃	CH ₃	H	O 4-N_iC₃H₇-i	H	O	m.p. 85.0
649	CH ₃	CH ₃	H	O 4-N_iC₃H₇-i	4-F	O	Paste
650	CH ₃	CH ₃	H	O 4-N_iC₃H₇-i	4-OCH ₃	O	n_D ²⁰ 1.5861

- Cont'd -

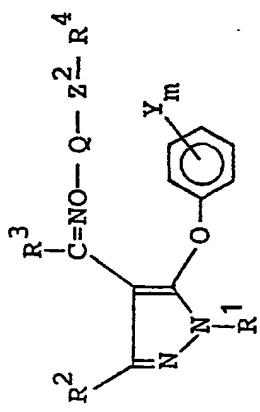
Table 1 (a) (Cont'd)

651	CH ₃	CH ₃	H	H	O	m.p. 115.1
652	CH ₃	CH ₃	H	4-F'	O	n_D^{20} 1.5718
653	CH ₃	CH ₃	H	H	O	n_D^{20} 1.5730
654	CH ₃	CH ₃	H	4-F'	O	n_D^{20} 1.5551
655	CH ₃	CH ₃	H	4-OCH ₃	O	n_D^{20} 1.5660
						- Cont'd -

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Table 1(a). (Cont'd)

Table I(b)

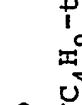
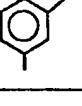
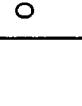
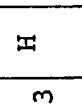


This formula corresponds to the general formula
(I) wherein z¹ is an oxygen atom.

Compound No.	R ¹	R ²	R ³	Q	Z ²	R ⁴	Y _m	Physical property m.p. (°C) or refractive index
658	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		H	n _D ²⁰ 1.5657
659	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		H	n _D ²⁰ 1.5760
660	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		H	n _D ²⁰ 1.5683
661	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		H	n _D ²⁰ 1.5704

- Cont'd -

Table 1 (b) (Cont'd)

662	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		4-F	n _D ²⁰	1.5524
663	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		H	m.p.	63.4
664	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		H	n _D ²⁰	1.5592
665	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		4-Cl	n _D ²⁰	1.5641
666	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		3-Cl	n _D ²⁰	1.5669
667	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		4-OCH ₃	n _D ²⁰	1.5606
668	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		H	n _D ²⁰	1.5509
669	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	0		3-OCH ₃	n _D ²⁰	1.5459

- Cont'd -

Table 1 (b) (cont'd)

670	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₄ H ₉ -t	4-OCH ₃	m.p.	59.6
671	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₄ H ₉ -t	3-CF ₃	n _D ²⁰	1.5287
672	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C(CH ₃) ₂ -C ₆ H ₄ -CH ₃	H	n _D ²⁰	1.5612
673	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C(CH ₃) ₂ -C ₆ H ₄ -CH ₃	4-Cl	n _D ²⁰	1.5741
674	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C ₆ H ₄ -F	H	n _D ²⁰	1.5618
675	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C ₆ H ₄ -F	H	n _D ²⁰	1.5657
676	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C ₆ H ₄ -F	4-Cl	m.p.	100.2
677	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	CH ₃ -C ₆ H ₄ -F	H	n _D ²⁰	1.5552

- Cont'd -

Table 1(b) (Cont'd)

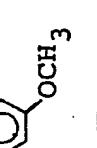
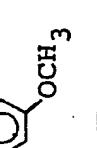
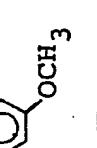
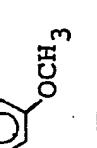
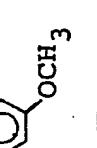
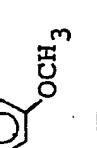
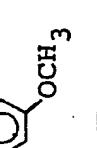
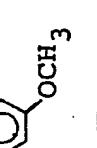
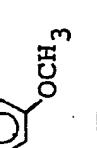
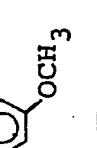
678	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5738
679	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5730
680	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5681
681	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	m.p. 51.2
682	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5722
683	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5795
684	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5936
685	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	m.p. 101.5
686	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	m.p. 86.1
687	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C(F)-	n _D ²⁰ 1.5833

- cont'd -

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Table 1(b) (Cont'd)

688	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-F	m.p.	87.7
689	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		²⁰ n _D	1.5777	
690	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		H	m.p.	58.6
691	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		²⁰ n _D	1.5769	
692	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		H	²⁰ n _D	1.5583
693	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-Cl	m.p.	90.3
694	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-F	²⁰ n _D	1.5565
695	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-OCH ₃	m.p.	81.5
696	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		H	²⁰ n _D	1.5682
697	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-F	m.p.	53.0

- Cont'd -

Table 1 (b) (Cont'd)

698	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{OC}_2\text{H}_5$	4-OCH ₃	m.p.	103.6
699	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{O}-\text{C}_6\text{H}_4-$	H	n_D^{20}	1.5800
700	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{SCH}_3$	H	n_D^{20}	1.5901
701	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{SCH}_3$	H	n_D^{20}	1.5835
702	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{COCH}_3$	H	n_D^{20}	1.5742
703	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{CH}(\text{OCH}_3)_2$	H	n_D^{20}	1.5851
704	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{COOCH}_3$	H	m.p.	60.6
705	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{COOCH}_3$	H	m.p.	60.5
706	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{COOC}_2\text{H}_5$	H	n_D^{20}	1.5577
707	CH_3	CH_3	H	- CH_2CH_2^-	O	$-\text{C}_6\text{H}_4-\text{COOC}_3\text{H}_7$	H	n_D^{20}	1.5579

+ Cont'd -

Table 1(b) (Cont'd)

708	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—COOC ₃ H ₇ -i	4-Cl	n _D ²⁰ 1.5581
709	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—COOC ₃ H ₇ -t	H	n _D ²⁰ 1.5632
710	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—COOC ₄ H ₉ -s	H	n _D ²⁰ 1.5577
711	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—COOC ₄ H ₉ -n	H	n _D ²⁰ 1.5555
712	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—COOC ₄ H ₉ -t	H	n _D ²⁰ 1.5490
713	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—CH ₃	H	n _D ²⁰ 1.5616
714	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—CH ₃	4-Cl	m.p. 92.5
715	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—CH ₃	3-Cl	n _D ²⁰ 1.5701
716	CH ₃	CH ₃	H	-CH ₂ CH ₂ ⁻	O	—CH ₃	4-OCH ₃	n _D ²⁰ 1.5598

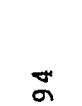
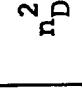
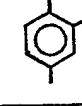
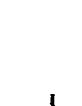
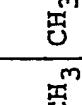
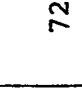
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table 1(b) (Cont'd)

717	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5813
718	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5838
719	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5846
720	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		m.p. 80.3
721	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5862
722	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5816
723	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O		n _D ²⁰ 1.5756

- Cont'd -

Table 1(b) (cont'd)

724	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5798
725	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		m.p.	72.2
726	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		m.p.	73.8
727	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5694
728	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5665
729	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5588
730	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5677
731	CH_3	CH_3	H	$-\text{CH}_2\text{CH}_2^-$	O		n_D^{20}	1.5650

- Cont'd -

Table 1(b) (Cont'd)

732	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-F	n _D ²⁰ 1.5552
733	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-OCH ₃	n _D ²⁰ 1.5657
734	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-OCH ₃	n _D ²⁰ 1.5682
735	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		4-F	n _D ²⁰ 1.5612
736	CH ₃	CH ₃	H	-CH ₂ CH ₂ -		H	n _D ²⁰ 1.5737
737	CH ₃	C ₂ H ₅	H	-CH ₂ CH ₂ -		H	n _D ²⁰ 1.5626
738	CH ₃	C ₃ H ₇	H	-CH ₂ CH ₂ -		H	n _D ²⁰ 1.5571

- Cont'd -

Table 1 (b) (cont'd)

739	CH ₃	CH ₃	CH ₃	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₄ H ₉ -t	H	n _D ²⁰ 1.5530
740	CH ₃	CH ₃	H	-CH ₂ CH-	O	-C ₆ H ₄ -	H	n _D ²⁰ 1.5530
741	CH ₃	CH ₃	H	CH ₃	O	-C ₆ H ₄ -	4-F	n _D ²⁰ 1.5484
742	CH ₃	CH ₃	H	-CH ₂ CH-	O	-C ₆ H ₄ -CH ₃	H	n _D ²⁰ 1.5520
743	CH ₃	CH ₃	H	CH ₃	O	-C ₆ H ₄ -C ₄ H ₉ -t	H	n _D ²⁰ 1.5405
744	CH ₃	CH ₃	H	-CH ₂ CH-	O	-C ₆ H ₄ -C ₄ H ₉ -t	4-F	n _D ²⁰ 1.5368
745	CH ₃	CH ₃	H	CH ₃	O	-C ₆ H ₄ -OCH ₃	H	n _D ²⁰ 1.5482
746	CH ₃	CH ₃	H	-CH ₂ CH-	O	-C ₆ H ₄ -O-	H	n _D ²⁰ 1.5693

- Cont'd -

Table 1 (b) (Cont'd)

747	CH ₃	CH ₃	H	-CH ₂ CH-	C ₃ H ₇ -t	O	—O—CH ₃	H	n _D ²⁰ 1.5453
748	CH ₃	CH ₃	H	-CH ₂ CH-	C ₃ H ₇ -t	O	—O—CH ₃	4-F	n _D ²⁰ 1.5418
749	CH ₃	CH ₃	H	-CH ₂ CH-	C ₃ H ₇ -t	O	—O—CH ₃	4-Cl	n _D ²⁰ 1.5613
750	CH ₃	CH ₃	H	-CH ₂ CH-	C ₃ H ₇ -t	O	—O—CH ₃	4-OCH ₃	n _D ²⁰ 1.5440
751	CH ₃	CH ₃	H	-CH ₂ CH-	—	S	—S—	H	n _D ²⁰ 1.5594
752	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	—	S	—S—CH ₃	H	n _D ²⁰ 1.5902
753	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	—	S	—S—C ₄ H ₉ -t	H	n _D ¹⁰ 1.5775
754	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	—	S	—S—Cl	m.p.	87.4
755	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	—	S	—S—Cl	m.p.	96.4

- Cont'd -

Table 1(b) (cont'd)

756	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	—	n _D ²⁰ 1.5647
757	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-F	n _D ²⁰ 1.5593
758	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-Cl	n _D ²⁰ 1.5766
759	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-OCH ₃	n _D ²⁰ 1.5700
760	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	H	n _D ²⁰ 1.5520
761	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	H	n _D ²⁰ 1.5746
762	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-Cl	n _D ²⁰ 1.5764
763	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-F	n _D ²⁰ 1.5648
764	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	4-OCH ₃	n _D ²⁰ 1.5748
765	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ ⁻		O	-O-	H	n _D ²⁰ 1.5689
766	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ ⁻		O	-O-	H	n _D ²⁰ 1.5670

- Cont'd -

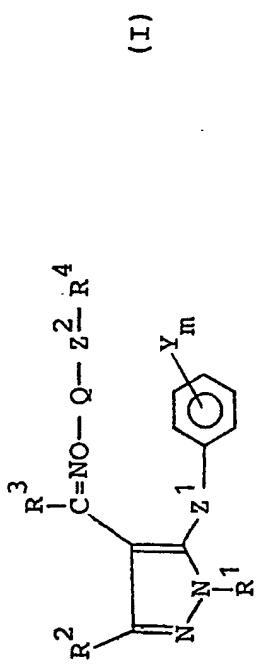
Table 1 (b) (Cont'd)

				4-F				
					n_D^{20}	1.5553		
767	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O			
768	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5678
769	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5605
770	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5620
771	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5511
772	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5672
773	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5653
774	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5638
775	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5763
776	CH ₃	CH ₃	H	-CH ₂ CH=CHCH ₂ -	O		n_D^{20}	1.5712
777	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O		n_D^{20}	1.5635
							- Cont'd -	

Table 1 (b) (Cont'd)

778	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₄ H ₉ -t	H	n _D ²⁰ 1.5511
779	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O	-C ₆ H ₄ -Cl	H	n _D ²⁰ 1.5671
780	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O	-C ₆ H ₄ -Cl	H	n _D ²⁰ 1.5583
781	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₄ H ₉ -t	H	n _D ²⁰ 1.5478
782	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ -	O	-C ₆ H ₄ -Cl	H	n _D ²⁰ 1.5631
783	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₆ H ₅	4-Cl	m.p. 110.1
784	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₆ H ₅	H	m.p. 107.4
785	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₆ H ₄ -C ₆ H ₅	H	n _D ²⁰ 1.6107
786	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-COCH ₃	H	n _D ²⁰ 1.5411
787	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-CO-C ₆ H ₅	H	n _D ²⁰ 1.5632
788	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₄ H ₉ -t	H	n _D ²⁰ 1.5273
789	CH ₃	CH ₃	H	-CH ₂ CH ₂ -	O	-C ₂ H ₅	H	n _D ²⁰ 1.5407

Table I(c)



Compound No.	R ¹	R ²	R ³	-Q-Z ² -R ⁴	Y _m	Physical property m.p. (°C) or refractive index
790	CH ₃	CH ₃	H	-CH ₃	H	m.p. 70.2
791	CH ₃	CH ₃	H	-C ₂ H ₅	H	n _D ²⁰ 1.5504
792	CH ₃	CH ₃	H	-CH ₂ CH ₂ Br	H	n _D ²⁰ 1.5721
793	CH ₃	CH ₃	H	-C ₃ H ₇ -1	H	n _D ²⁰ 1.5432
794	CH ₃	CH ₃	H	-CH ₂ CH=CH ₂	H	n _D ²⁰ 1.5560
795	CH ₃	CH ₃	H	-CH ₂ C≡CH	4-C1	n _D ²⁰ 1.5670
796	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ Br	H	n _D ²⁰ 1.5618

- Cont'd -

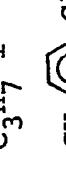
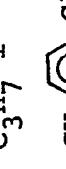
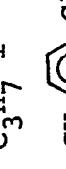
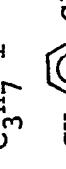
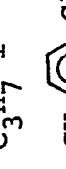
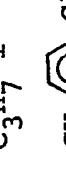
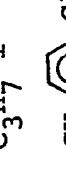
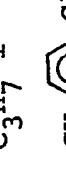
Table I(c) (Cont'd)

797	CH ₃	CH ₃	H	-CH ₂ CH=C(CH ₃) ₂	H	²⁰ n _D 1.5494
798	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ Br	H	²⁰ n _D 1.5571
799	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ Br	H	²⁰ n _D 1.5522
800	CH ₃	CH ₃	H	CH ₃ -CH ₂ CH=C(CH ₂ CH ₂ CH=CH ₃) ₂	H	²⁰ n _D 1.5267
801	CH ₃	CH ₃	H	CH ₃ -CH ₂ CH=C(CH ₂ CH ₂ CH=CH ₃) ₂	4-F	²⁰ n _D 1.5294
802	CH ₃	CH ₃	H	CH ₃ -CH ₂ CH=C(CH ₂ CH ₂ CH=CH ₃) ₂	4-Cl	²⁰ n _D 1.5290
803	CH ₃	CH ₃	H	-CH ₂ CH ₂ N O	H	²⁰ n _D 1.5408
804	CH ₃	CH ₃	H	-CH ₂ CCl=CHCl	H	²⁰ n _D 1.5578
805	CH ₃	CH ₃	H	-CH ₂ -CH ₂ -Cl	4-Cl	²⁰ n _D 1.5653
806	CH ₃	CH ₃	H	-CH ₂ -CH ₂ -C ₄ H ₉ -t	H	²⁰ n _D 1.5470

- Cont'd -

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Table I (C) (Cont'd)

807	CH ₃	CH ₃	H	-CH ₂ -  -C ₃ H ₇ -t	H	²⁰ n _D 1.5662
808	CH ₃	CH ₃	H	-CH ₂ -  -C ₃ H ₇ -t	H	²⁰ n _D 1.5675
809	CH ₃	CH ₃	H	-CH ₂ -  -C ₄ H ₉ -t	H	m.p. 86.9
810	CH ₃	CH ₃	H	-CH ₂ -  -C ₄ H ₉ -t	H	²⁰ n _D 1.5716
811	CH ₃	CH ₃	H	-CH ₂ -CH ₂ - 	H	²⁰ n _D 1.5674
812	CH ₃	CH ₃	H	-CH ₂ CH ₂ -  -F	H	²⁰ n _D 1.5602
813	CH ₃	CH ₃	H	-CH ₂ CH ₂ -  -F	H	²⁰ n _D 1.5524
814	CH ₃	CH ₃	H	-CH ₂ CH ₂ -  -F	H	²⁰ n _D 1.5621

- Cont'd -

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Table I(c) (Cont'd)

815	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -F	4-OCH ₃	²⁰ n _D 1.5588
816	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	H	²⁰ n _D 1.5653
817	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-F	²⁰ n _D 1.5547
818	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-Cl	²⁰ n _D 1.5688
819	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-OCH ₃	²⁰ n _D 1.5643
820	CH ₃	CH ₃	H	-CH ₂ CH ₂ -C ₆ H ₄ -OCH ₃	H	²⁰ n _D 1.5755
821	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ C ₆ H ₅	H	²⁰ n _D 1.5747
822	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₅	H	²⁰ n _D 1.5654
823	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₅	H	²⁰ n _D 1.5757
824	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₅	4-Cl	²⁰ n _D 1.5751
825	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₅	4-OCH ₃	²⁰ n _D 1.5733
					- Cont'd -	

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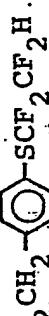
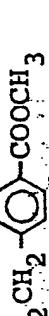
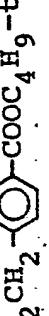
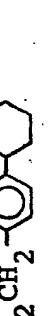
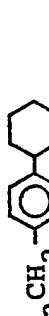
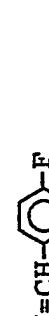
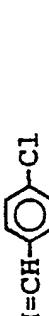
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Table I(c) (Cont'd)

826	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	H	n _D ²⁰ 1.5543
827	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-F	n _D ²⁰ 1.5450
828	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-Cl	n _D ²⁰ 1.5578
829	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₄ H ₉ -t	4-OCH ₃	n _D ²⁰ 1.5539
830	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₅ H ₁₁ -n	H	n _D ²⁰ 1.5463
831	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -OCH ₃	H	n _D ²⁰ 1.5695
832	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -C ₅ H ₁₁ -n	4-F	n _D ²⁰ 1.5332
833	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -OCH ₃	4-F	n _D ²⁰ 1.5613
834	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -OCH ₃	4-Cl	n _D ²⁰ 1.5760
835	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -C ₆ H ₄ -OCH ₃	4-OCH ₃	n _D ²⁰ 1.5690

- Cont'd. -

Table I (b) (Cont'd)

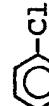
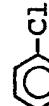
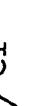
836	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -  SCF ₂ CF ₂ H.	H	²⁰ n _D 1.5545
837	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -  COOCH ₃	H	²⁰ n _D 1.5722
838	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -  COOC ₄ H ₉ -t	H	²⁰ n _D 1.5577
839	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -  - 	H	²⁰ n _D 1.5660
840	CH ₃	CH ₃	H	-CH ₂ CH ₂ CH ₂ -  - 	²⁰ n _D 1.5576	
841	CH ₃	CH ₃	H	-CH ₂ CH=CH- 	4-Cl	²⁰ n _D 1.5060
842	CH ₃	CH ₃	H	-CH ₂ CH=CH-  -F	H	²⁰ n _D 1.5647
843	CH ₃	CH ₃	H	-CH ₂ CH=CH-  -F	4-Cl	²⁰ n _D 1.5829
844	CH ₃	CH ₃	H	-CH ₂ CH=CH- 	4-OCH ₃	²⁰ n _D 1.5732
845	CH ₃	CH ₃	H	-CH ₂ CH=CH-  -Cl	H	²⁰ n _D 1.5972

- cont'd -

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Table I(b) (Cont'd)

846	CH ₃		H	-CH ₂ CH=CH-  -Cl	4-Cl	²⁰ n _D 1.5980
847	CH ₃	CH ₃	H	-CH ₂ CH=CH-  -Cl	H	m.P. 119.9
848	CH ₃	CH ₃	H	-CH ₂ C≡C- 	H	²⁰ n _D 1.6045
849	CH ₃	CH ₃	H	-CH ₂ C≡C- 	4-Cl	²⁰ n _D 1.5886
850	CH ₃	CH ₃	H	-CH ₂ C≡C-  -F	H	Paste
851	CH ₃	CH ₃	H	-CH ₂ C≡C-  -F	4-F	²⁰ n _D 1.5828
852	CH ₃	CH ₃	H	-CH ₂ C≡C-  -Cl	H	Paste
853	CH ₃	CH ₃	H	-CH ₂ C≡C-  -Cl	4-F	Paste
854	CH ₃	CH ₃	H	-CH ₂ C≡C-  -Cl	4-Cl	Paste
855	CH ₃	CH ₃	H	-CH ₂ C≡C-  -Cl	4-OCH ₃	²⁰ n _D 1.5815

- Cont'd -

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Table I(b) (cont'd)

856	CH_3	CH_3	 	$-\text{CH}_3$		H	n_{D}^{20}	1.5822
857	CH_3	CH_3	 	$-\text{CH}_2\text{CH}=\text{CH}_2$		H	n_{D}^{20}	1.5800

1 Note 1. ^1H NMR value (CDCl_3 , TMS) of Compound No. 180:

1.62 (6H, s), 2.33 (3H, s), 3.53 (3H, s),
 4.83 (2H, d, $J=48\text{Hz}$), 4.95 (2H, s),
 6.7 - 7.9 (9H, m), 7.75 (1H, s)

5 Note 2. ^1H NMR value (CDCl_3 , TMS) of compound No. 299:

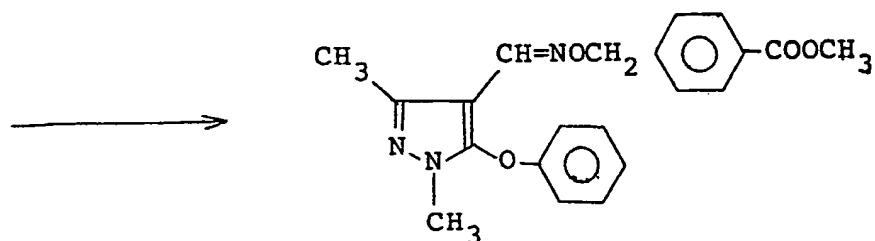
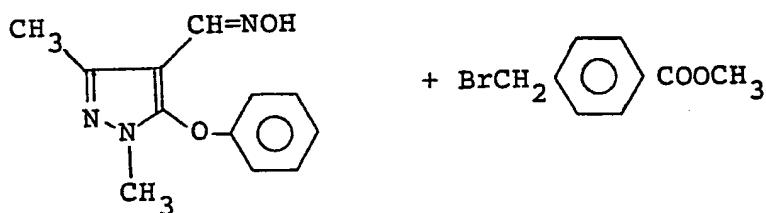
1.37 (6H, s), 2.34 (3H, s), 3.55 (3H, s),
 4.53 (2H, d, $J=47.5\text{Hz}$), 4.95 (2H, s),
 6.7 - 7.4 (9H, m), 7.76 (1H, s)

Production of the compounds of the present

10 invention will be illustrated with reference to the following examples, but it is not limited to these examples.

Example 1 Methyl 4-[(1,3-dimethyl-5-phenoxyprazol-4-yl)methyleneaminooxymethyl]benzoate

15 (compound No. 16)



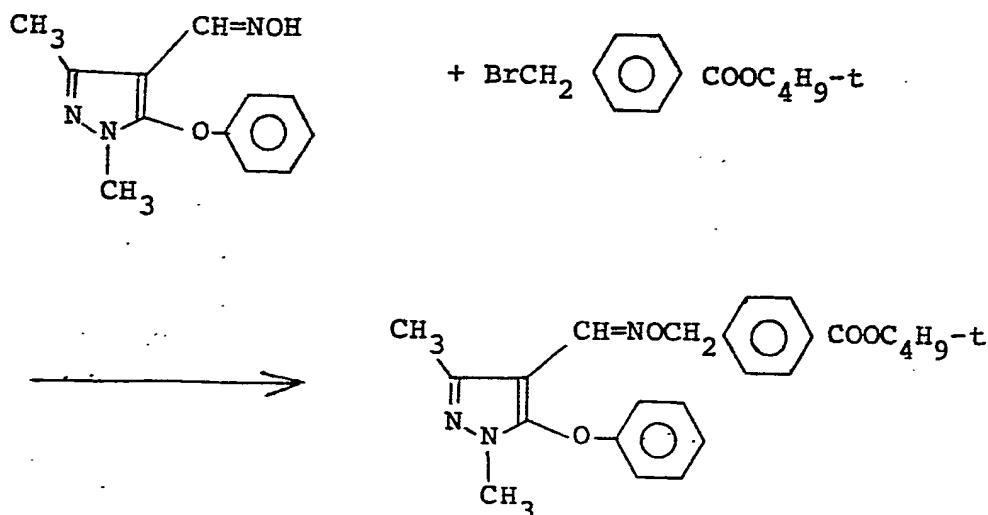
2.0 Grams (0.00865 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime, 1.98 g (0.00865 mole)

1 of methyl 4-bromomethylbenzoate and 1.19 g (0.009 mole) of potassium carbonate were added to 50 ml of acetone, and the resulting mixture was heated under reflux for 8 hours.

After completion of the reaction, acetone was removed by 5 evaporation under reduced pressure, after which water was added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product 10 was column-chromatographed on silica gel to obtain 2.0 g of the desired product.

Yield 61%. n_D^{20} 1.5612

Example 2 Tert-butyl 4-[(1,3-dimethyl-5-phenoxyprazol-4-yl)methyleneaminooxymethyl]benzoate (compound 15 No. 60)

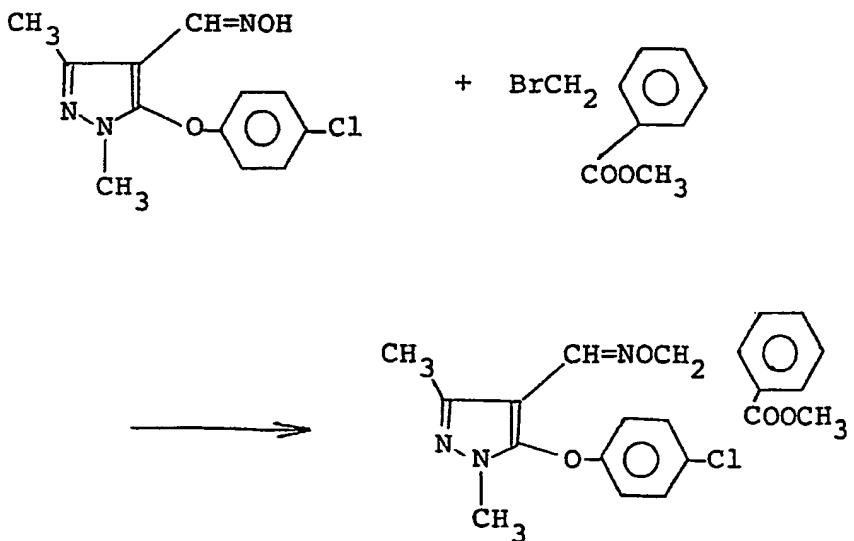


2.0 Grams (0.00855 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime was dissolved in 20 ml

1 of dimethyl sulfoxide, and after adding 0.65 g (0.0116 mole) of powdery potassium hydroxide, the resulting mixture was stirred at 30°C for 30 minutes. To this solution was added 2.32 g (0.00855 mole) of tert-butyl 4-
 5 bromomethylbenzoate, and reaction was carried out at from 50° to 60°C for 1 hour. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was
 10 removed by evaporation to obtain crude crystals. The crystals were recrystallized from methanol to obtain 2.4 g of the desired compound.

Yield 67.0%. m.p. 101.7°C.

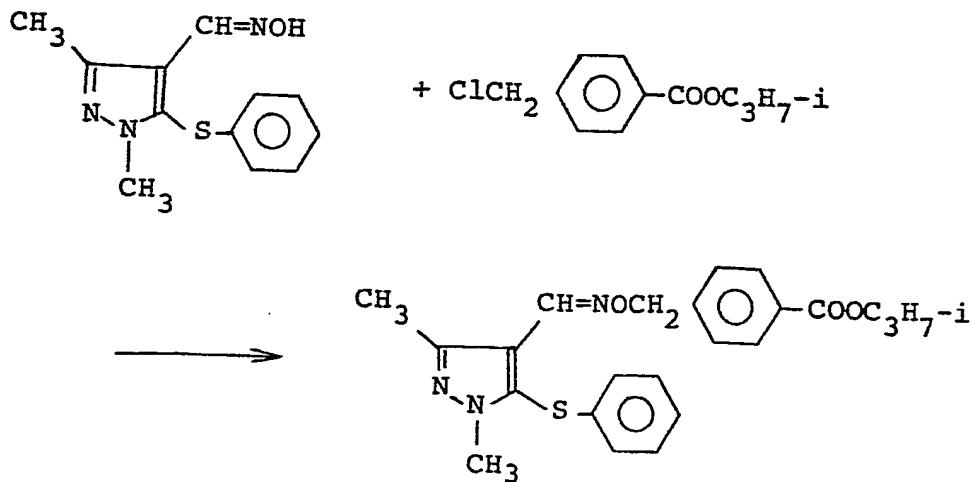
Example 3 Methyl 2-[{5-(4-chlorophenoxy)-1,3-dimethyl-
 15 pyrazol-4-yl}methyleneaminoxymethyl]benzoate
 (compound No. 3)



1 2.0 Grams (0.00755 mole) of 5-(4-chlorophenoxy)-
 1,3-dimethyl-pyrazole-4-carbaldehyde oxime was dissolved in
 20 ml of dimethylformamide, and after adding 0.5 g (0.0125
 mole) of powdery sodium hydroxide, the resulting mixture
 5 was thoroughly stirred. To this solution was added 1.73 g
 (0.00755 mole) of methyl 2-bromomethylbenzoate, and
 reaction was carried out at from 70° to 80°C for 5 hours.
 After completion of the reaction, water was added to the
 reaction solution which was then extracted with ethyl
 10 acetate. The ethyl acetate extract was washed with water
 and dried, and ethyl acetate was removed by evaporation to
 obtain an oily product. This oily product was column-
 chromatographed on silica gel to obtain 2.0 g of the
 desired compound.

15 Yield 64.0%. n_D^{20} 1.5788.

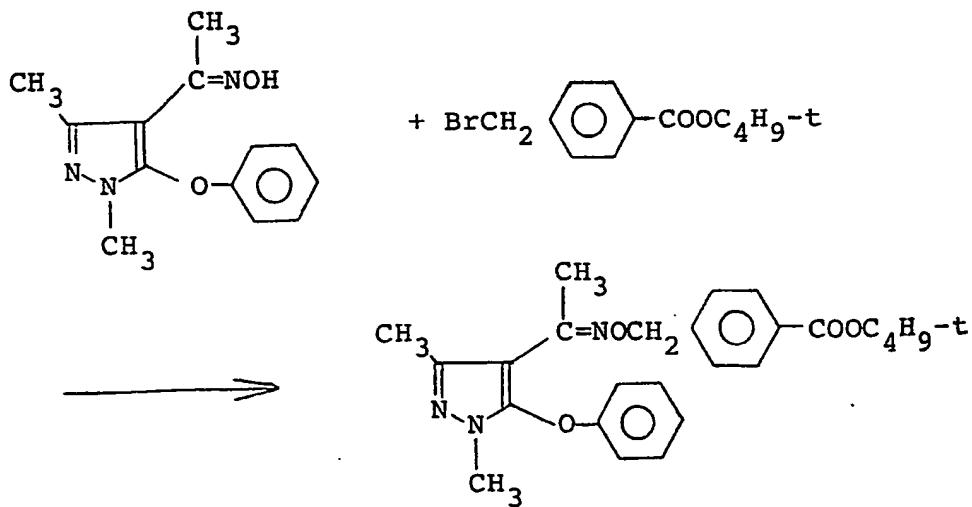
**Example 4 Isopropyl 4-[(1,3-dimethyl-5-phenylthiopyrazol-4-yl)methyleneaminooxymethyl]benzoate
 (compound No. 174)**



1 3.0 Grams (0.0121 mole) of 1,3-dimethyl-5-phenylthiopyrazole-4-carbaldehyde oxime, 2.57 g (0.0121 mole) of isopropyl 4-chloromethylbenzoate and 2.8 g (0.026 mole) of sodium carbonate were added to 50 ml of methyl
5 ethyl ketone, and the resulting mixture was heated under reflux for 5 hours. After completion of the reaction, methyl ethyl ketone was removed by evaporation under reduced pressure, after which water was added to the residue and extraction was carried out with ethyl acetate.
10 The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 3.0 g of the desired compound.

Yield 59.0%. n_D^{20} 1.5821.

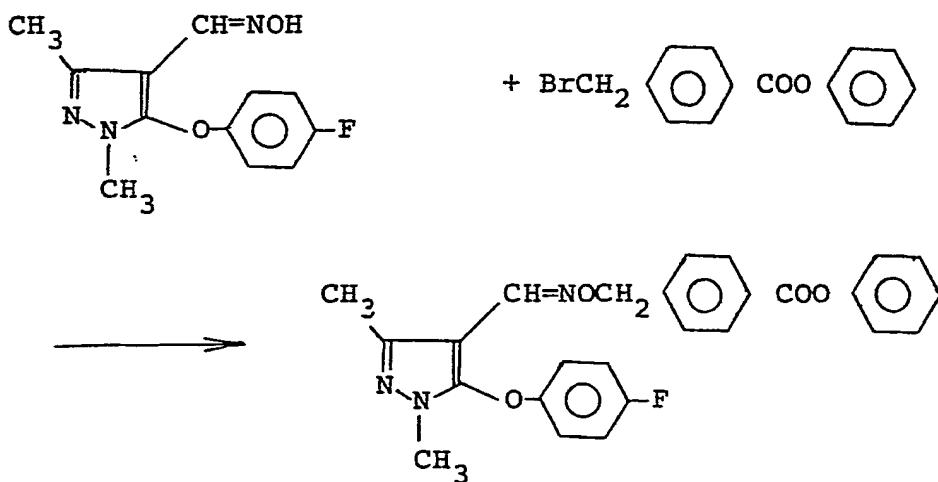
15 Example 5 Tert-butyl 4-[1-(1,3-dimethyl-5-phenoxy)pyrazol-4-yl]-ethylideneaminooxymethyl] benzoate
(compound No. 166)



1 2.0 Grams (0.00816 mole) of methyl 1,3-dimethyl-
5-phenoxy-pyrazol-4-yl ketone oxime, 2.2 g (0.00816 mole)
of tert-butyl 4-bromomethylbenzoate and 4.0 g (0.028 mole)
of potassium carbonate were added to 50 ml of acetonitrile,
5 and the resulting mixture was heated under reflux for 5
hours. After completion of the reaction, acetonitrile was
removed by evaporation under reduced pressure, after which
water was added to the residue and extraction was carried
out with ethyl acetate. The ethyl acetate extract was
10 washed with water and dried, and ethyl acetate was removed
by evaporation to obtain crude crystals. The crystals were
recrystallized from methanol to obtain 2.8 g of the desired
compound.

Yield 79.0%. m.p. 94.4°C.

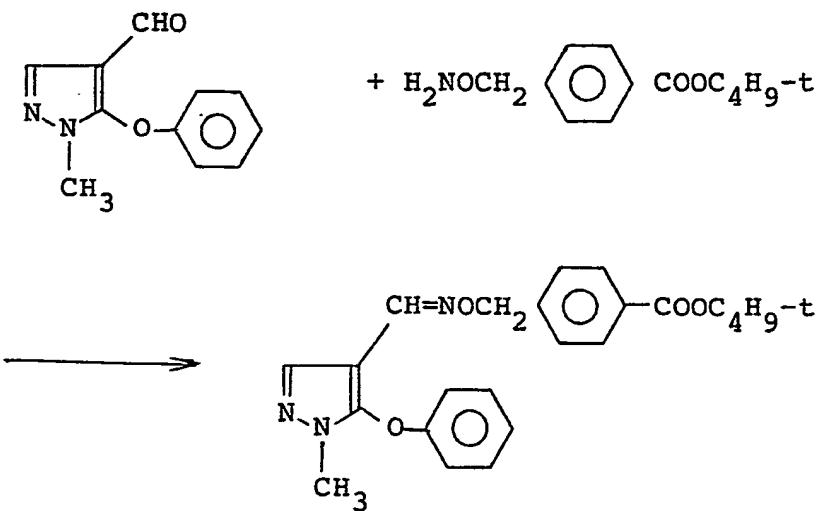
15 Example 6 Cyclohexyl 4-[{5-(4-fluorophenoxy)-1,3-
dimethylpyrazol-4-yl}methylenaminoxy-
methyl]benzoate (compound No. 119)



1 2.0 Grams (0.008 mole) of 5-(4-fluorophenoxy)-
1,3-dimethylpyrazole-4-carbaldehyde oxime and 0.5 g (0.0125
mole) of powdery sodium hydroxide were added to 50 ml of
dimethyl sulfoxide, and the resulting mixture was stirred
5 for 30 minutes. To this solution was added 2.38 g (0.008
mole) of cyclohexyl 4-bromomethylbenzoate, and reaction was
carried out at from 70° to 80°C for 6 hours. After
completion of the reaction, water was added to the reaction
solution which was then extracted with ethyl acetate. The
10 ethyl acetate extract was washed with water and dried, and
ethyl acetate was removed by evaporation to obtain an oily
product. This oily product was column-chromatographed on
silica gel to obtain 3.0 g of the desired compound.

Yield 80.0%. n_D^{20} 1.5863.

15 Example 7 Tert-butyl 4-[(1-methyl-5-phenoxy)pyrazol-4-
y1)methyleneaminooxymethyl]benzoate (compound
No. 174)



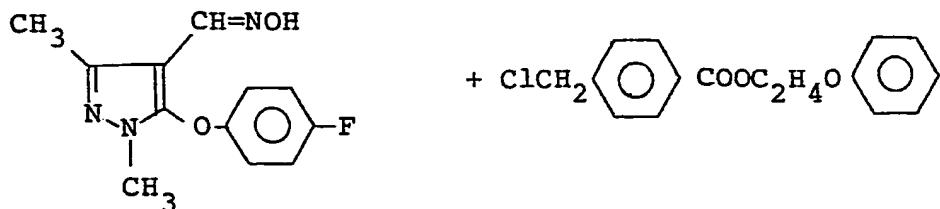
1 1.0 Gram (0.0049 mole) of 1-methyl-5-phenoxyypyrazole-4-carbaldehyde and 1.1 g (0.0049 mole) of tert-butyl 4-aminooxymethylbenzoate were added to 20 ml of ethanol, and the resulting mixture was heated under reflux
5 to carry out reaction. After completion of the reaction, ethanol was removed by evaporation, after which water was added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by
10 evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.6 g of the desired compound.

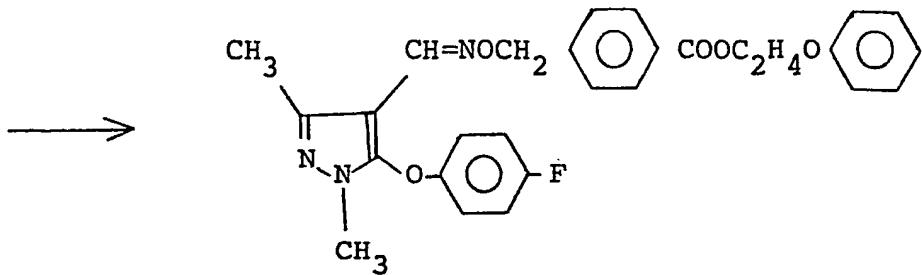
Yield 80%. Form of product: paste.

NMR (CDCl_3 , TMS):

15 δ (ppm) 1.56 (s, 9H), 3.60 (s, 3H),
4.96 (s, 2H), 6.60 - 7.40 (m, 7H),
7.63 (s, 1H), 7.66 (s, 1H),
7.75 - 8.00 (m, 2H).

Example 8 2-phenoxyethyl 4-[{5-(4-fluorophenoxy)-
20 1,3-dimethylpyrazol-4-yl}methylenaminoxy-
methyl]benzoate (compound No. 142)

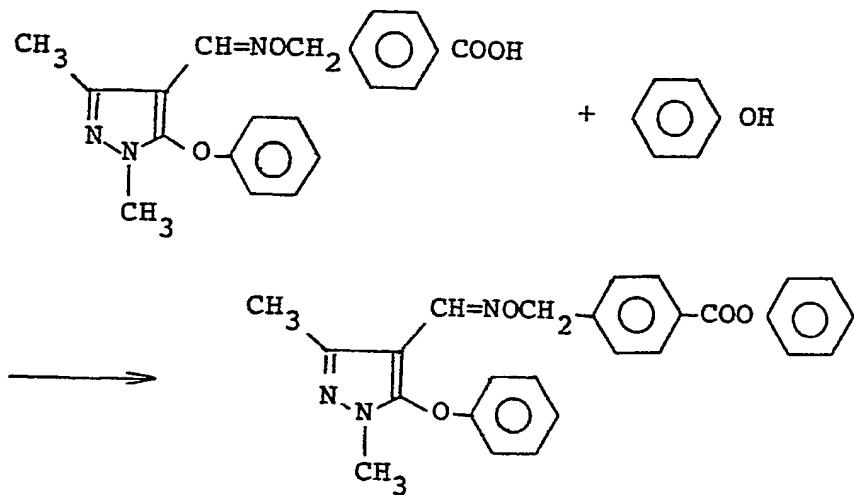




1 2.0 Grams (0.008 mole) of 5-(4-fluorophenoxy)-
1,3-dimethylpyrazole-4-carbaldehyde oxime was dissolved in
20 ml of dimethyl sulfoxide, and after adding 0.65 g
(0.0116 mole) of powdery potassium hydroxide, the resulting
5 solution was stirred at 30° C for 30 minutes. To this
solution was added 2.5 g (0.00865 mole) of 2-phenoxyethyl
4-chloromethylbenzoate, and reaction was carried out at
from 50° to 60° C for 1 hour. After completion of the
reaction, water was added to the reaction solution which
10 was then extracted with ethyl acetate. The ethyl acetate
extract was washed with water and dried, and ethyl acetate
was removed by evaporation to obtain an oily product. This
oily product was column-chromatographed on silica gel to
obtain 3.0 g of the desired compound.

15 Yield 75.0%. n_{D}^{20} 1.5655.

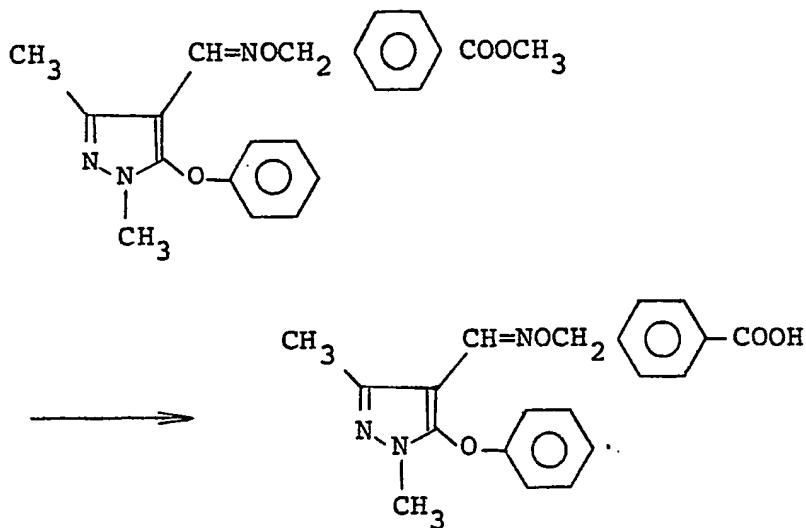
1 Example 9 Phenyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]benzoate (compound No. 161)



1.0 Gram (0.0027 mole) of 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]benzoic acid,
5 0.25 g (0.0027 mole) of phenol and 0.7 g (0.0027 mole) of triphenylphosphine were added to 50 ml of ether, and the
10 resulting mixture was stirred. To this solution was added 0.47 g (0.0027 mole) of diethyl azodicarboxylate, and the
resulting solution was heated under reflux for 3 hours.
After completion of the reaction, the ether layer was
15 filtered, and ether was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 0.9 g of the desired compound.

Yield 76.0%. n_D^{20} 1.5656.

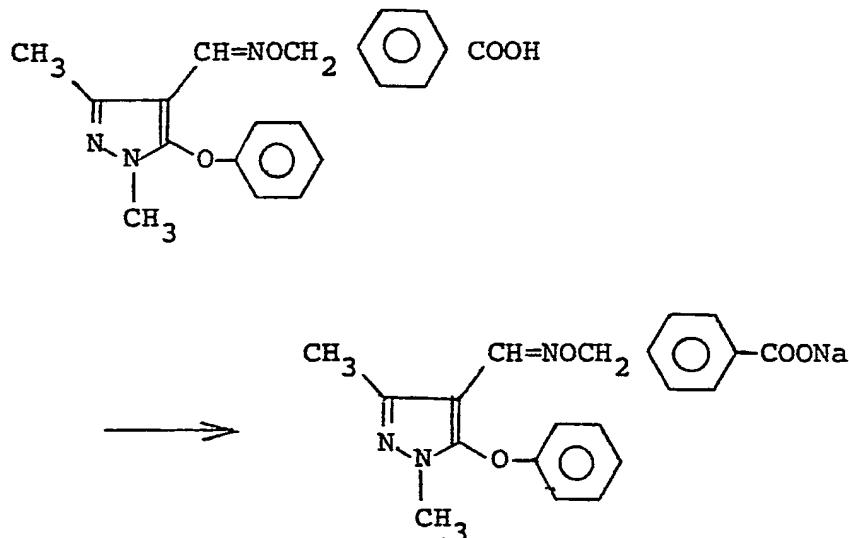
1 Example 10 4-[(1,3-Dimethyl-5-phenoxyprazol-4-yl)-
methylenaminooxymethyl]benzoic acid (compound
No. 14)



Three grams (0.0079 mole) of methyl 4-[(1,3-
5 dimethyl-5-phenoxyprazol-4-yl)methylenamino]benzoate was dissolved in 20 ml of methanol and a solution
of 0.24 g of lithium hydroxide in 5 ml of water was added.
Reaction was then carried out at room temperature for 2
hours. After completion of the reaction, methanol was
10 removed by evaporation, and after adding water, the
solution was acidified with hydrochloric acid to
precipitate crystals. The crystals were collected by
filtration to obtain 2 g of the desired compound.

Yield 70%. m.p. 183.3°C.

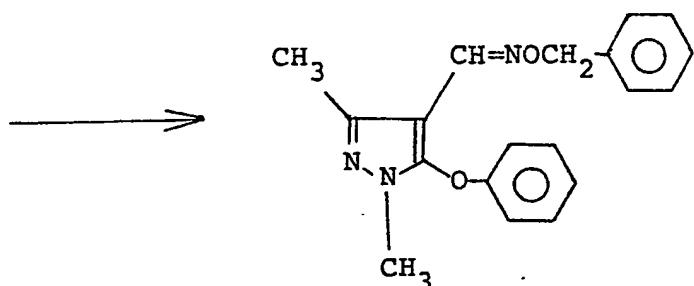
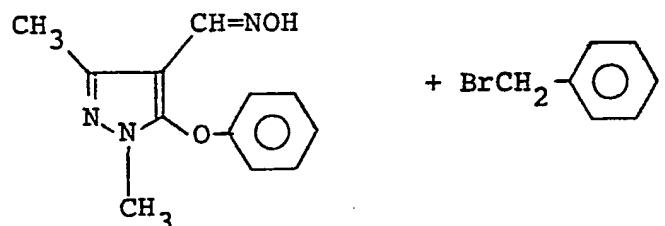
1 Example 11 Sodium 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]benzoate (compound No. 15)



1.0 Gram (0.0027 mole) of 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]benzoic acid and 0.07 g (0.0028 mole) of sodium hydroxide were added to 10 ml of water, and the resulting mixture was stirred for 2 hours. After completion of the reaction, water was removed by evaporation under reduced pressure to obtain the desired compound in a quantitative yield.

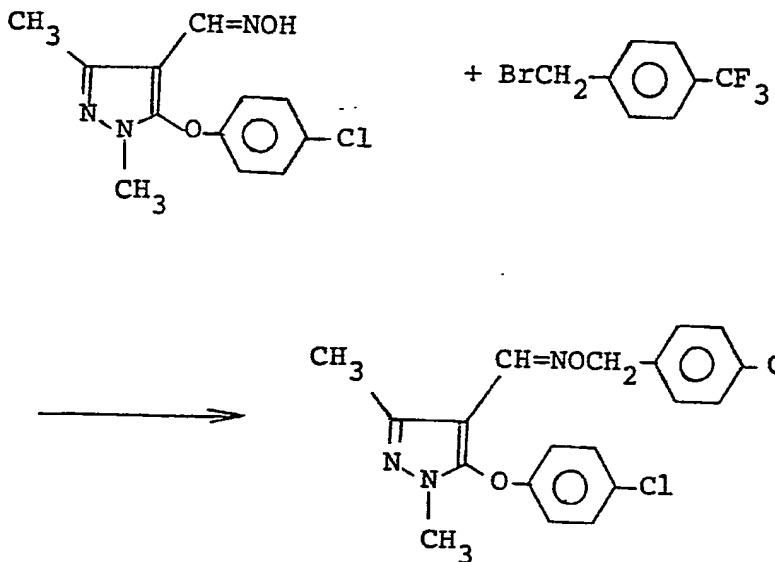
m.p. >300°C.

1 Example 12 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-benzyl ether (compound No. 181)



2.0 Grams (0.00866 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime, 1.5 g (0.0087 mole)
5 of benzyl bromide and 2.0 g (0.0145 mole) of potassium carbonate were dissolved in 50 ml of acetone, and the resulting solution was heated under reflux for 7 hours. After completion of the reaction, acetone was removed by evaporation under reduced pressure, after which water was
10 added and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 2.6 g of the desired compound.
15 Yield 93.0%. n_{D}^{20} 1.5517.

- 1 Example 13 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-trifluoromethylbenzyl ether (compound No. 195)

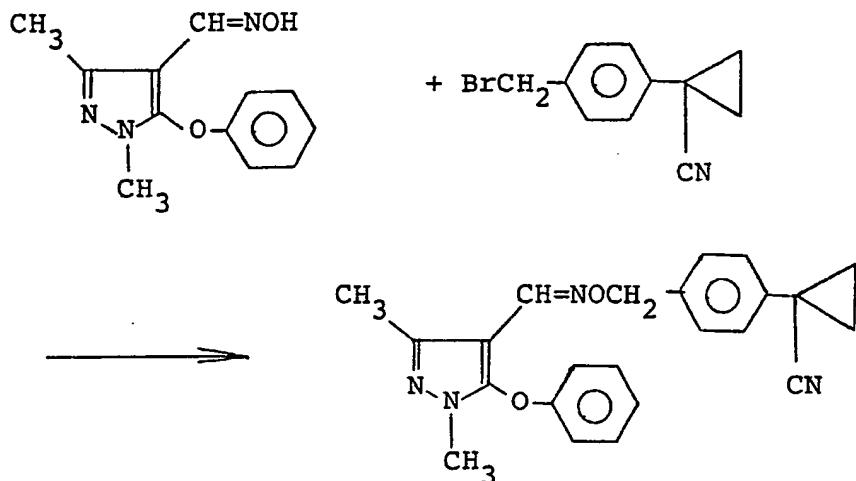


2.0 Grams (0.0075 mole) of 5-(chlorophenoxy)-1,3-

- 5 dimethylpyrazole-4-carbaldehyde oxime was dissolved in 40 ml of tetrahydrofuran, and after adding 0.19 g (0.0079 mole) of sodium hydride at room temperature, the resulting solution was stirred. Thereafter, 1.7 g (0.0071 mole) of 4-trifluoromethylbenzyl bromide was added, followed by
10 heating under reflux for 3 hours. After completion of the reaction, 100 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily
15 product. This oily product was column-chromatographed on silica gel to obtain 2.7 g of the desired compound.

Yield 85.0%. n_D^{20} 1.5539.

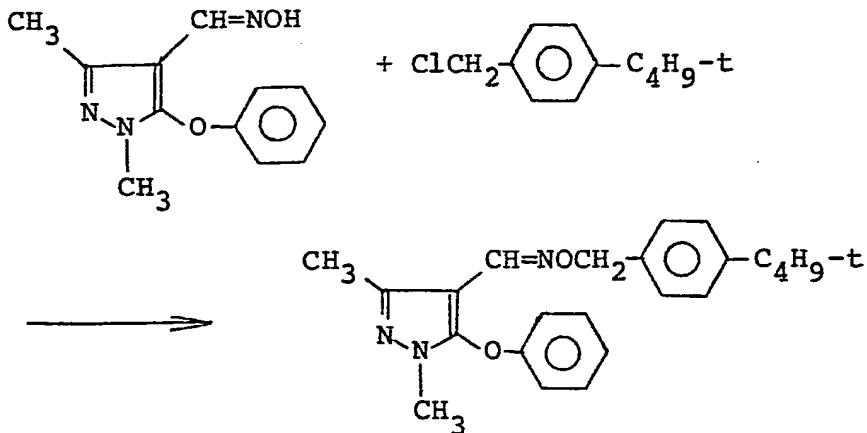
1 Example 14 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde oxime O-4-(1-cyanocyclopropyl)benzyl ether
(compound No. 199)



2.0 Grams (0.0086 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime was dissolved in 30 ml of dimethylformamide, and a solution of 0.5 g (0.0125 mole) of sodium hydroxide in 5 ml of water was added. After stirring was continued for 30 minutes, 2.0 g (0.0086 mole) of 1-(4-bromomethylphenyl)cyclopropane-1-carbonitrile was added to the solution, and reaction was carried out at from 60° to 70°C for 3 hours. After completion of the reaction, 100 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 2.8 g of the desired compound.

Yield 84.0%. m.p. 109.1°C.

1 Example 15 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde oxime 4-tert-butylbenzyl ether (compound No. 205)

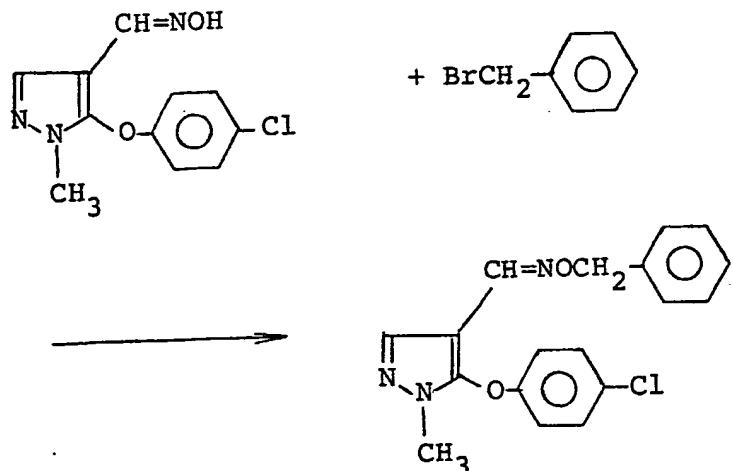


2.0 Grams (0.0086 mole) of 1,3-dimethyl-5-

5 phenoxyprazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 1.0 g (0.0178 mole) of potassium hydroxide, the resulting solution was stirred at room temperature for 30 minutes. To this solution was added 1.5 g (0.0086 mole) of 4-tert-butylbenzyl chloride,
 10 and reaction was carried out at from 50° to 60°C for 3 hours. After completion of the reaction, 100 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by
 15 evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 2.4 g of the desired compound.

Yield 74.0%. n_{D}^{20} 1.5402.

1 Example 16 5-(4-Chlorophenoxy)-1-methylpyrazole-4-carbaldehyde oxime O-benzyl ether (compound No. 279)

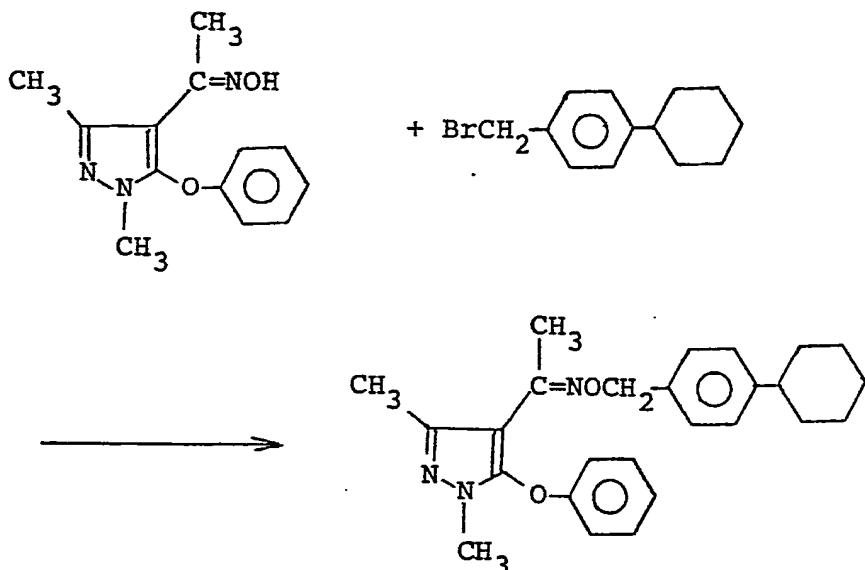


2.0 Grams (0.0092 mole) of 5-(4-chlorophenoxy)-1-methylpyrazole-4-carbaldehyde oxime, 1.5 g (0.0092 mole) of benzyl bromide and 2.0 g (0.0145 mole) of potassium carbonate were dissolved in 50 ml of acetonitrile, and the resulting solution was heated under reflux for 9 hours.

After completion of the reaction, 100 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 2.2 g of the desired compound.

Yield 78.0%. n_D^{20} 1.5933.

1 Example 17 1,3-Dimethyl-5-phenoxyprazol-4-yl methyl
ketone oxime O-4-cyclohexylbenzyl ether
(compound No. 283)



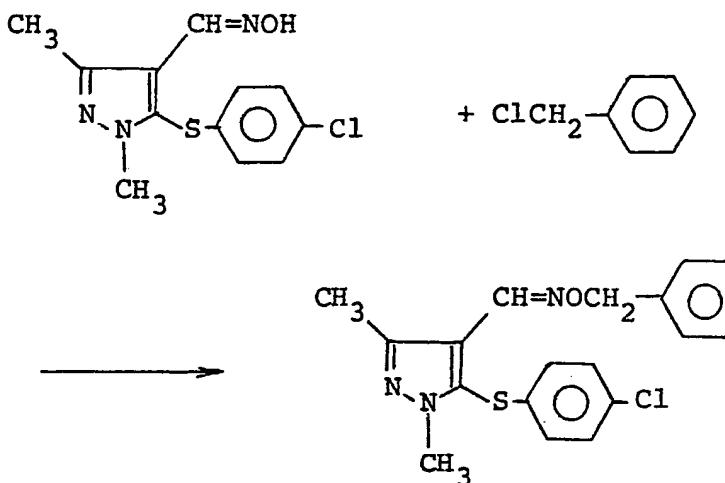
2.0 Grams (0.0040 mole) of 1,3-dimethyl-5-
5 phenoxyprazol-4-yl methyl ketone oxime was dissolved in 30
ml of dioxane, and 0.1 g (0.0042 mole) of sodium
borohydride was added to the solution with thorough
stirring. After 30 minutes, 1.6 g (0.0038 mole) of 4-
cyclohexylbenzyl bromide was added to the reaction solution
10 which was then heated under reflux for 5 hours. After
completion of the reaction, 100 ml of water was added to
the reaction solution which was then extracted with ethyl
acetate. The ethyl acetate extract was washed with water
and dried, and ethyl acetate was removed by evaporation to
15 obtain an oily product. This oily product was column-
chromatographed on silica gel to obtain 1.2 g of

1 the desired compound.

Yield 72.0%. n_D^{20} 1.5775

Example 18 5-(4-Chlorophenylthio)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-benzyl ether (compound No.

5 290)

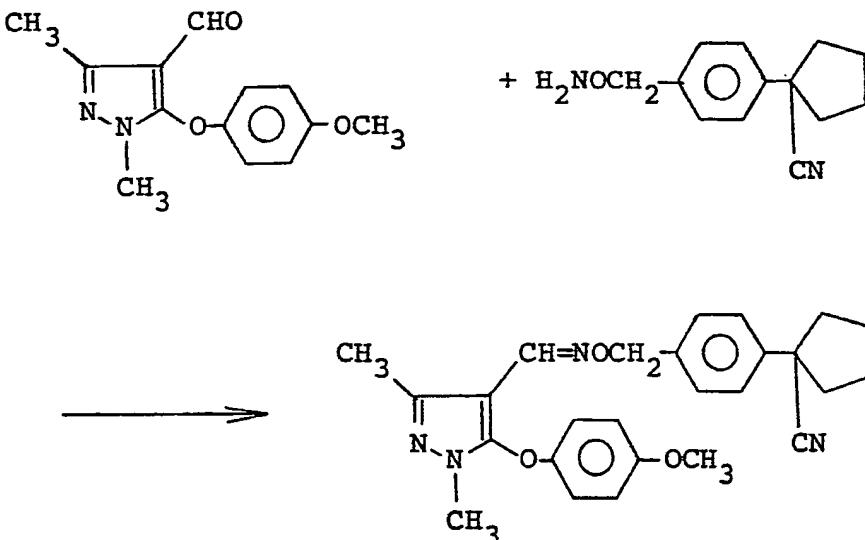


2.0 Grams (0.0071 mole) of 5-(4-chlorophenylthio)-1,3-dimethylpyrazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and to this solution was added a solution of 0.5 g (0.009 mole) of potassium hydroxide in 5 ml of water. After thorough stirring, 0.9 g (0.0071 mole) of benzyl chloride was added, and reaction was carried out at from 60° to 70°C for 2 hours. After completion of the reaction, 100 ml of water was added to the reaction solution which was then extracted 10 with ethyl acetate. The ethyl acetate extract was washed 15 with water and dried, and ethyl acetate was removed by

1 evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 2.3 g of the desired compound.

Yield 87.0%. n_D^{20} 1.5562.

5 Example 19 5-(4-Methoxyphenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-(1-cyanocyclopentyl)-benzyl ether (compound No. 238)

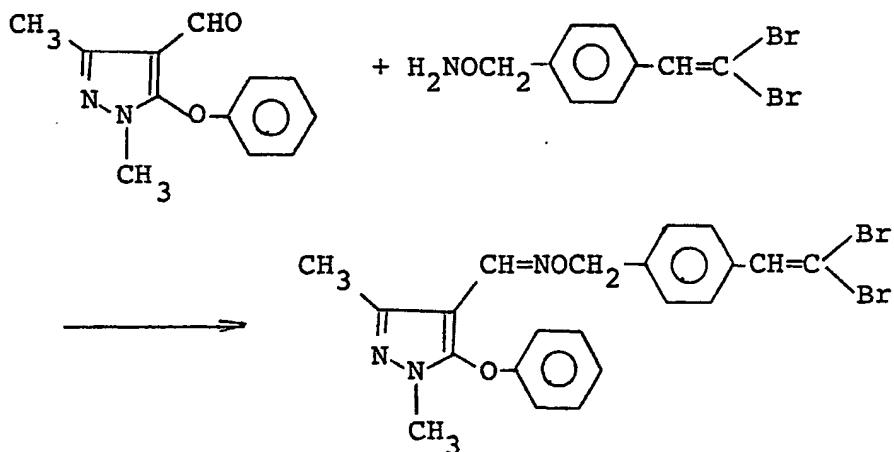


2.0 Grams (0.0081 mole) of 1,3-dimethyl-5-(4-methoxyphenoxy)pyrazole-4-carbaldehyde was dissolved in
10 50 ml of ethanol, and 1.7 g (0.0081 mole) of O-4-(1-cyanocyclopentyl)benzylhydroxylamine was added, after which reaction was carried out at from 50° to 60°C for 3 hours. After completion of the reaction, ethanol was removed by evaporation under reduced pressure, after which water was added and extraction was carried out with ethyl acetate.
15.

1 The ethyl acetate extract was washed with water and
dried, and ethyl acetate was removed by evaporation
to obtain an oily product. This oily product was column-
chromatographed on silica gel to obtain 3.0 g of the
5 desired compound.

Yield 83.0%. n_D^{20} 1.5632.

Example 20 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-4-(2,2-dibromovinyl)benzyl ether
(compound No. 262)

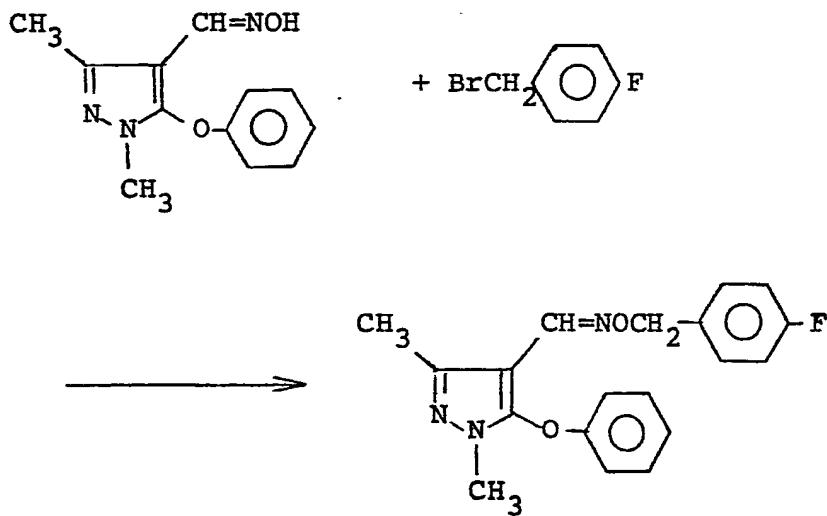


10 2.0 Grams (0.0093 mole) of 1,3-dimethyl-5-
phenoxyprazole-4-carbaldehyde was dissolved in 50 ml
of methanol, and 2.8 g (0.0091 mole) of O-4-(2,2-
dibromovinyl)benzylhydroxylamine was added to the solution
which was then heated under reflux for 3 hours. After
15 completion of the reaction, methanol was removed by
evaporation under reduced pressure, after which water was
added and extraction was carried out with ethyl acetate.

1 The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 3.5 g of the desired compound.

5 Yield 76.0%. m.p. 109.3°C.

Example 21 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime O-4-fluorobenzyl ether (compound No. 305)

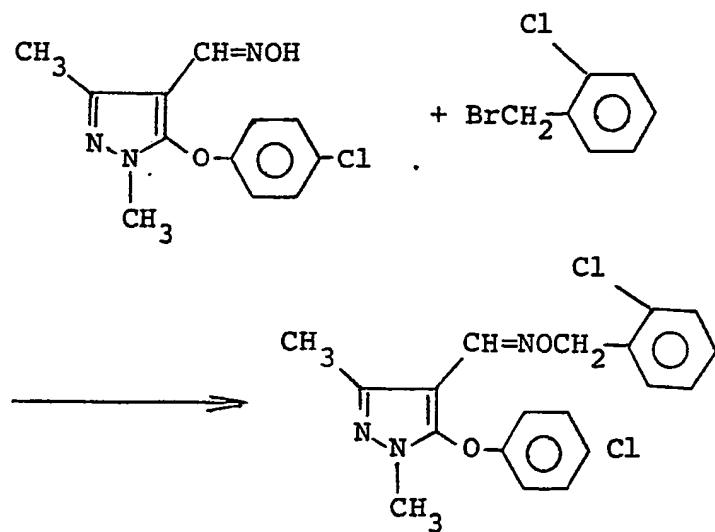


1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime was dissolved in 20 ml
10 of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of powdery potassium hydroxide, the resulting solution was stirred. To this reaction solution was added 0.81 g (0.0043 mole) of 4-fluorobenzyl bromide, and reaction was carried out at room temperature for 3 hours. After
15 completion of the reaction, 200 ml of water was added to the reaction solution which was then extracted with ethyl

1 acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.3g of the
5 desired compound.

Yield 89%. n_D^{20} 1.5681.

Example 22 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-2-chlorobenzyl ether
(compound No. 309)



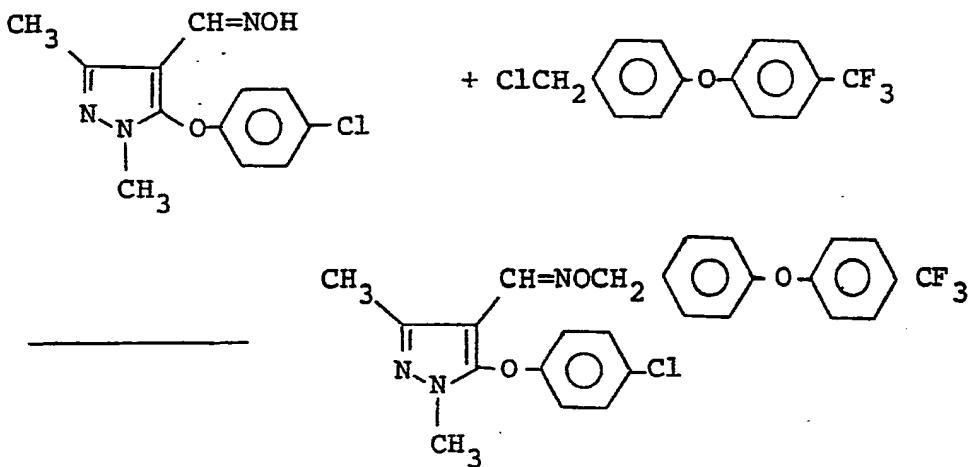
10 1.0 Gram (0.0038 mole) of 5-(4-chlorophenoxy)-
1,3-dimethylpyrazole-4-carbaldehyde oxime, 0.78 g (0.0038
mole) of 2-chlorobenzyl bromide and 1.0 g (0.0072 mole) of
potassium carbonate were added to 20 ml of acetonitrile,
and the resulting mixture was heated under reflux for 6
15 hours. After completion of the reaction, acetonitrile was
removed by evaporation under reduced pressure, after which

1 water was added and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-
 5 chromatographed on silica gel to obtain 1.2 g of the desired compound.

Yield 81%. n_D^{20} 1.5760

Example 23 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-(4-trifluoromethylphenoxy)benzyl ether (compound No. 322)

10



1.0 Gram (0.0038 mole) of 5-(4-chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime, 1.1 g (0.0038 mole) of 4-(4-trifluoromethylphenoxy)benzyl chloride and 0.8 g (0.076 mole) of sodium carbonate were added to 40 ml
 15 of acetone, and the resulting mixture was heated under reflux for 8 hours. After completion of the reaction,

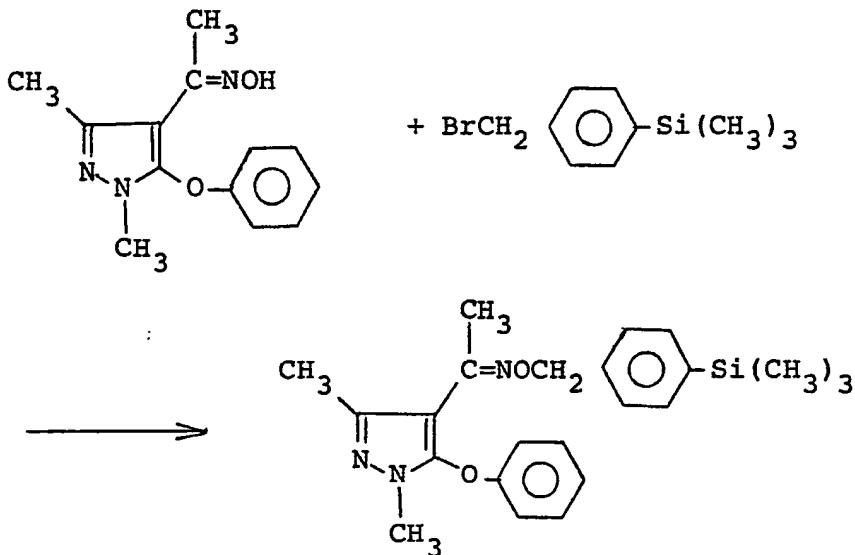
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- 1 acetone was removed by evaporation under reduced pressure,
after which water was added and extraction was carried out
with ethyl acetate. The ethyl acetate extract was washed
with water and dried, and ethyl acetate was removed by
5 evaporation to obtain an oily product. This oily product
was column-chromatographed on silica gel to obtain 1.4 g of
the desired compound.

Yield 72%. m.p. 97.8°C.

Example 24 1,3-Dimethyl-5-phenoxyypyrazol-4-yl methyl
ketone oxime O-4-trimethylsilylbenzyl ether

10 (compound No. 334)

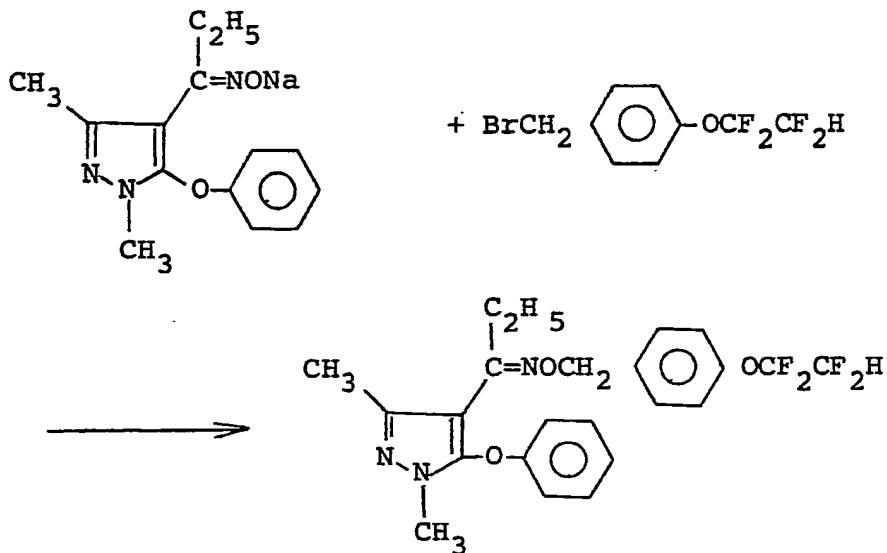


- 1.0 Gram (0.0041 mole) of 1,3-dimethyl-5-phenoxyypyrazol-4-yl methyl ketone oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of potassium hydroxide, the resulting solution was 15 stirred. To this reaction solution was added 1.0 g (0.0041 mole) of 4-trimethylsilylbenzyl bromide, and reaction was

1 carried out at room temperature for 4 hours. After completion of the reaction, 200 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water
5 and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.5 g of the desired compound.

Yield 92%. m.p. 61.2°C.

10 Example 25 1,3-Dimethyl-5-phenoxyprazol-4-yl ethyl ketone oxime 0-4-(1,1,2,2-tetrafluoroethoxy)benzyl ether (compound No. 354)



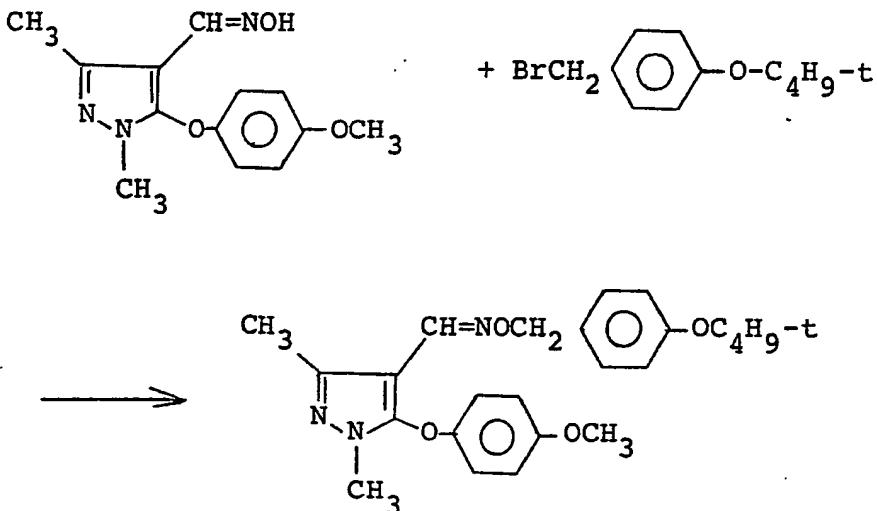
1.0 Gram (0.0035 mole) of sodium salt of 1,3-dimethyl-5-phenoxyprazol-4-yl ethyl ketone oxime and 1.0 g
15 (0.0035 mole) of 4-(1,1,2,2-tetrafluoroethoxy)benzyl

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1 bromide were added to 50 ml of acetone, and the resulting mixture was heated for 5 hours to carry out reaction. After completion of the reaction, acetone was removed by evaporation under reduced pressure, after which water was 5 added and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

10 Yield 76%. n_D^{20} 1.5252.

Example 26 5-(4-Methoxyphenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-tert-butoxybenzyl ether (compound No. 366)

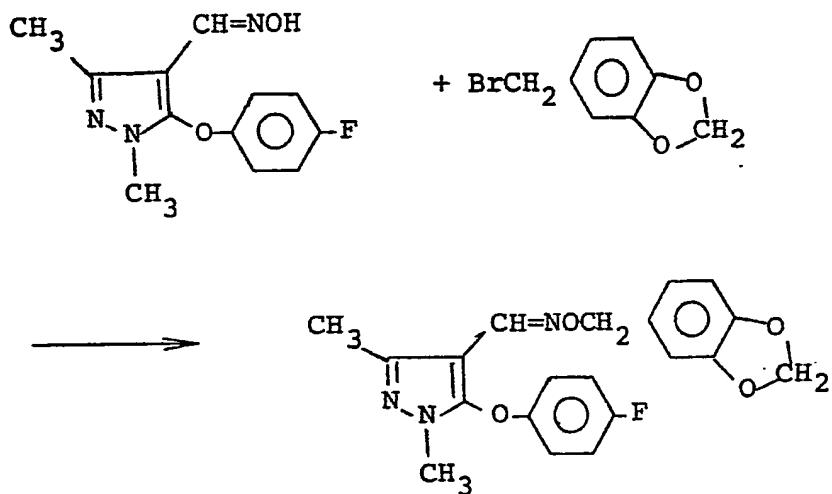


1.0 Gram (0.0038 mole) of 5-(4-methoxyphenoxy)-
15 1,3-dimethyl-pyrazole-4-carbaldehyde oxime was dissolved in
30 ml of tetrahydrofuran, and 0.092 g of sodium hydride was

- 1 added to synthesize the sodium salt of said oxime. To this solution was added 0.92 g (0.0038 mole) of 4-tert-butoxybenzyl bromide, and reaction was carried out at from 50° to 60°C for 5 hours. After completion of the reaction,
5 200 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to
10 obtain 1.3 g of the desired compound.

Yield 80%. n_D^{20} 1.5653

Example 27 5-(4-Fluorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-3,4-methylenedioxybenzyl ether (compound No. 374)



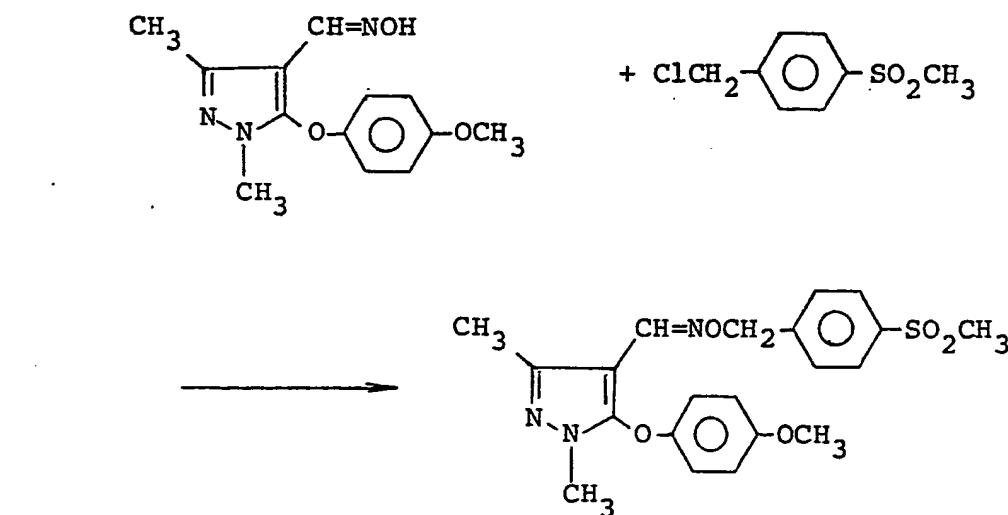
- 15 1.0 Gram (0.0040 mole) of 5-(4-fluorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethylformamide, and after adding 0.2 g (0.005

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1 mole) of sodium hydroxide, the resulting solution was stirred for 30 minutes. To this reaction solution was added 0.86 g (0.004 mole) of 3,4-methylenedioxybenzyl bromide, and reaction was carried out at from 40° to 50°C 5 for 3 hours. After completion of the reaction, 200 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This 10 oily product was column-chromatographed on silica gel to obtain 1.1 g of the desired compound.

Yield 72%. n_D^{20} 1.5750.

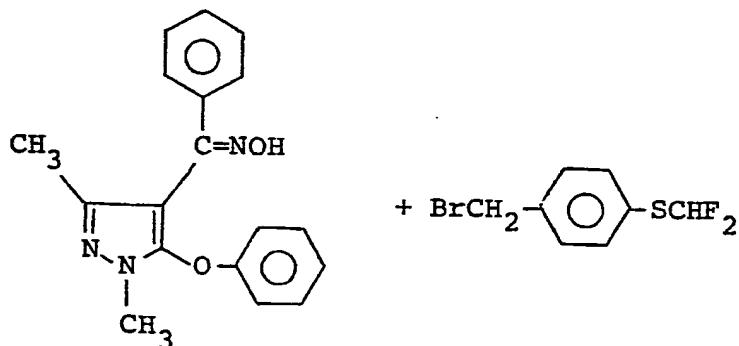
Example 28 5-(4-Methoxyphenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-methylsulfonylbenzyl ether (compound No. 401)



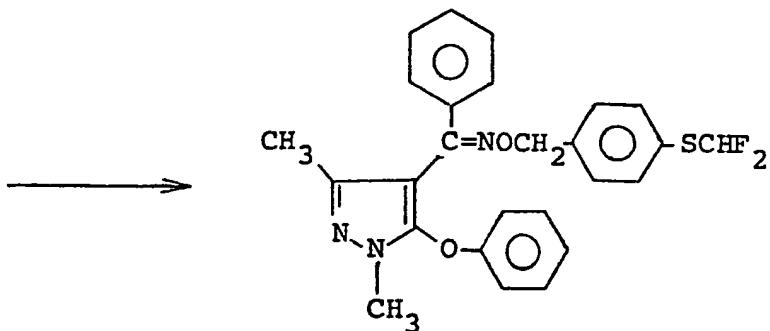
1 1.0 Gram (0.0038 mole) of 5-(4-methoxyphenoxy)-
 1,3-dimethylpyrazole-4-carbaldehyde oxime and 0.79 g
 (0.0038 mole) of 4-methylsulfonylbenzyl chloride were
 dissolved in 30 ml of tetrahydrofuran. To this solution
 5 was added 0.6 g (0.0039 mole) of 1,8-diazabicyclo[5.4.0]-
 7-undecene, and reaction was carried out at from 40° to
 50°C for 5 hours. After completion of the reaction, 200 ml
 of water was added to the reaction solution which was then
 extracted with ethyl acetate. The ethyl acetate extract
 10 was washed with water and dried, and ethyl acetate was
 removed by evaporation to obtain an oily product. This
 oily product was column-chromatographed on silica gel to
 obtain 1.2 g of the desired compound.

Yield 74%. n_D^{20} 1.5866.

15 Example 29 1,3-Dimethyl-5-phenoxyprazol-4-yl phenyl
 ketone oxime O-4-difluoromethylthiobenzyl ether
 (compound No. 426)



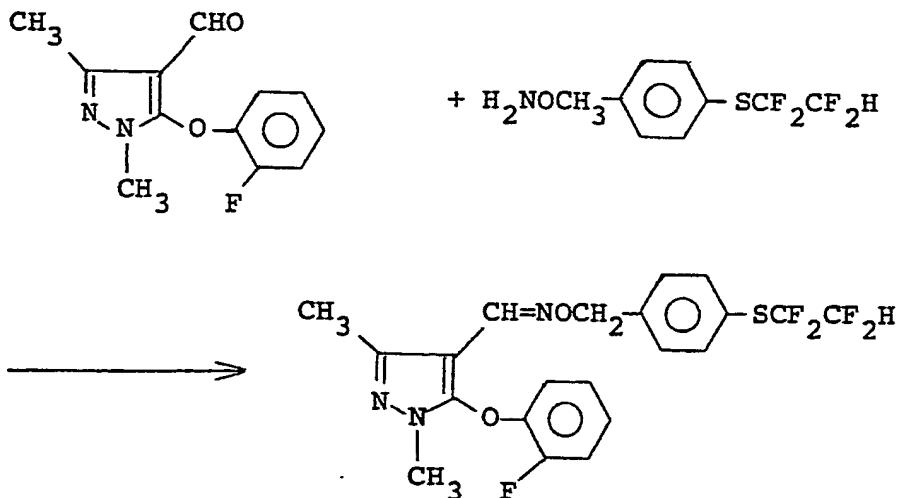
- 125 -



1 1.0 Gram (0.0033 mole) of 1,3-dimethyl-5-phenoxypyrazol-4-yl phenyl ketone oxime, 0.82 g (0.0033 mole) of 4-difluoromethylthiobenzyl bromide and 1.0 g (0.0072 mole) of potassium carbonate were added to 50 ml of
 5 acetone, and the resulting mixture was heated for 6 hours to carry out reaction. After completion of the reaction, acetone was removed by evaporation under reduced pressure, after which water was added and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed
 10 with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.4 g of the desired compound.

Yield 86%. n_D^{20} 1.5917.

1 Example 30 5-(2-Fluorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-(1,1,2,2-tetrafluoroethylthio)benzyl ether (compound No. 467)

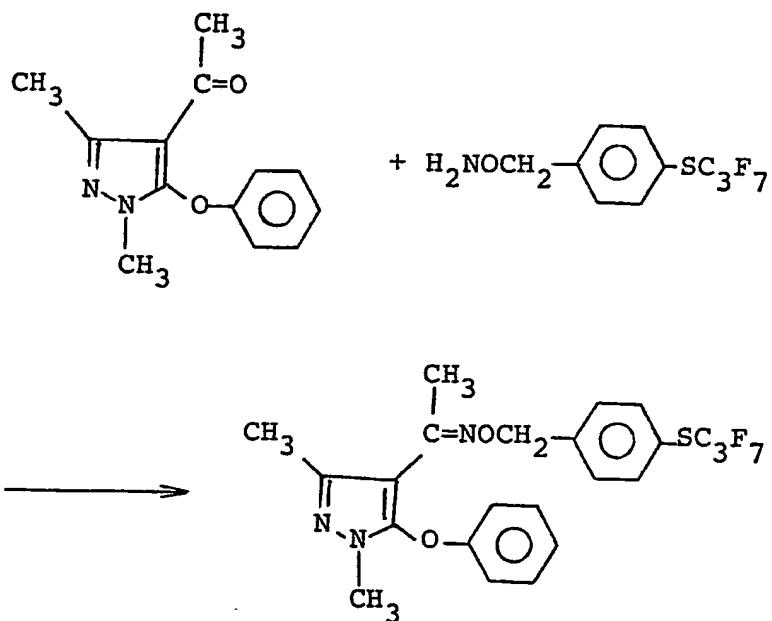


1.1 Gram (0.0043 mole) of 5-(2-fluorophenoxy)-

- 5 1,3-dimethylpyrazole-4-carbaldehyde was dissolved in 30 ml of ethanol, and 1.1 g (0.0043 mole) of O-[4-(1,1,2,2-tetrafluoroethylthio)benzyl]hydroxylamine was added. Reaction was then carried out at from 50° to 60°C for 2 hours. After completion of the reaction, ethanol was
- 10 removed by evaporation under reduced pressure, after which water was added and extraction was carried out with chloroform. The chloroform extract was dried, chloroform was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to
- 15 obtain 1.3 g of the desired compound

Yield 64%. n_{D}^{20} 1.5462.

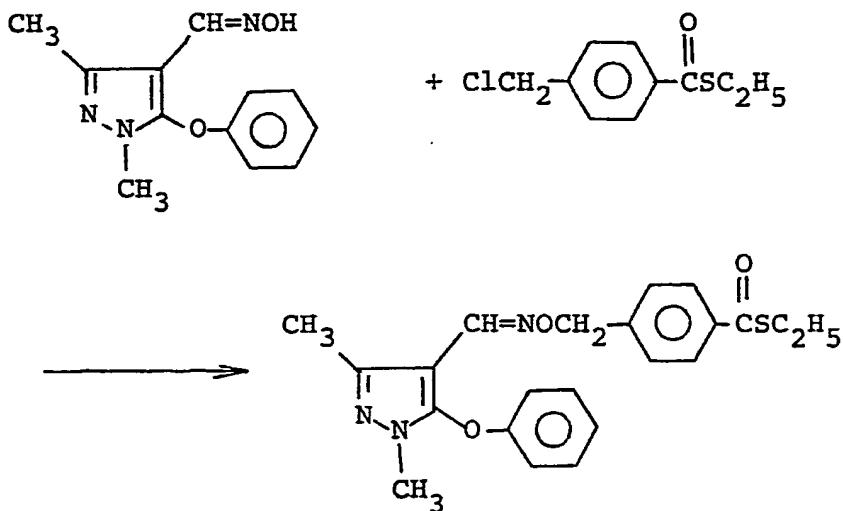
1 Example 31 1,3-Dimethyl-5-phenoxyprazol-4-yl methyl
ketone oxime O-4-heptafluoropropylthiobenzyl
ether (compound No. 494)



1.0 Gram (0.0043 mole) of 4-acetyl-1,3-dimethyl-
5 5-phenoxyprazole and 1.4 g (0.0043 mole) of O-(4-
heptafluoropropylthiobenzyl)hydroxylamine were added to 30
ml of methanol, and the resulting mixture was heated for 5
hours to carry out reaction. After completion of the
reaction, methanol was removed by evaporation under reduced
10 pressure, after which water was added and extraction was
carried out with chloroform. The chloroform extract was
dried, and chloroform was removed by evaporation to
obtain an oily product. This oily product was column-
chromatographed on silica gel to 1.4 g of the desired
15 compound.

Yield 60%. n_D^{20} 1.5217.

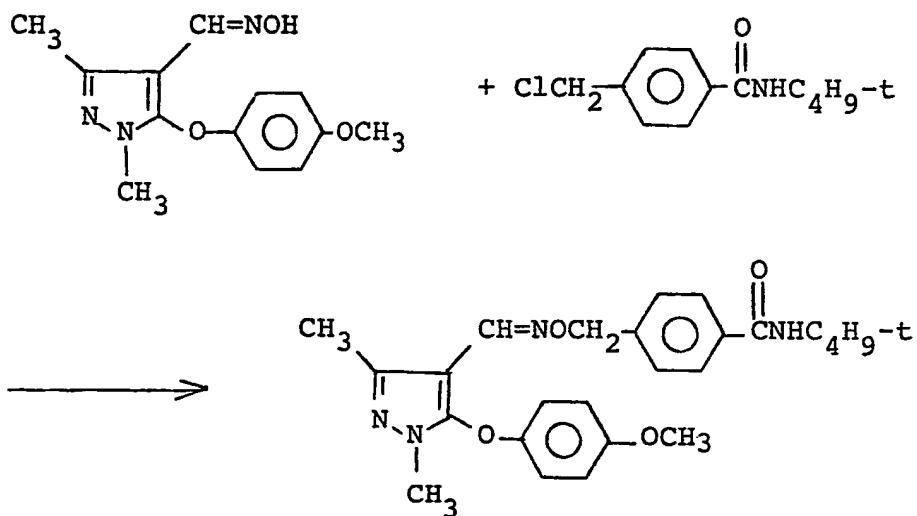
1 Example 32 S-Ethyl 4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]benzothioate
(compound No. 516)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxy pyrazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of powdery potassium hydroxide, the resulting solution was stirred. To this solution was added 0.92 g (0.0043 mole) of S-ethyl 4-chloromethylbenzothioate, and reaction was carried out at room temperature for 3 hours. After completion of the reaction, 200 ml of water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.4 g of the desired compound.

Yield 80%. n_{D}^{20} 1.5889.

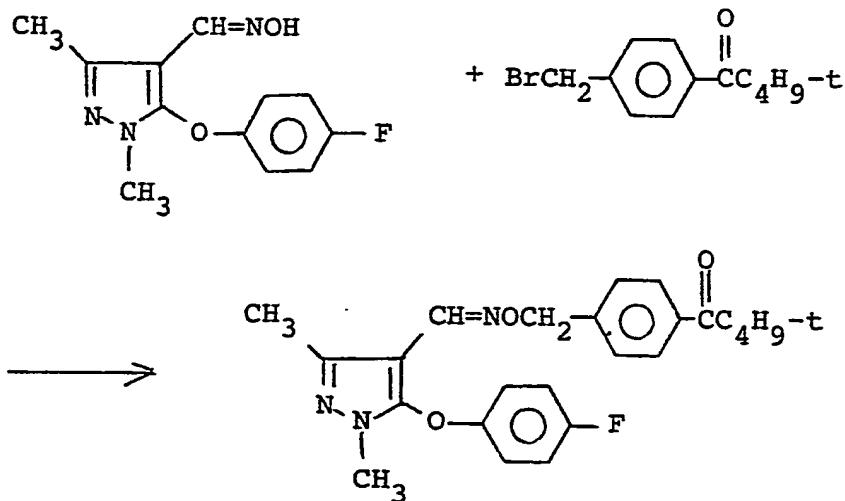
1 Example 33 N-Tert-butyl 4-[{5-(4-methoxyphenoxy)-1,3-dimethylpyrazol-4-yl}methylenaminomethyl]-benzamide (compound No. 525)



1.0 Gram (0.0038 mole) of 5-(4-methoxyphenoxy)-5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 0.86 g (0.0038 mole) of N-tert-butyl-4-chloromethylbenzamide and 1.0 g (0.0072 mole) of potassium carbonate were added to 20 ml of acetonitrile, and the resulting mixture was heated under reflux for 6 hours. After completion of the reaction, 10 acetonitrile was removed by evaporation under reduced pressure, after which water was added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily 15 product. This oily product was column-chromatographed on silica gel to obtain 1.4 g of the desired compound.

Yield 82%. n_D^{20} 1.5662.

1 Example 34 5-(4-Fluorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-4-pivaloylbenzyl ether
(compound No. 548)

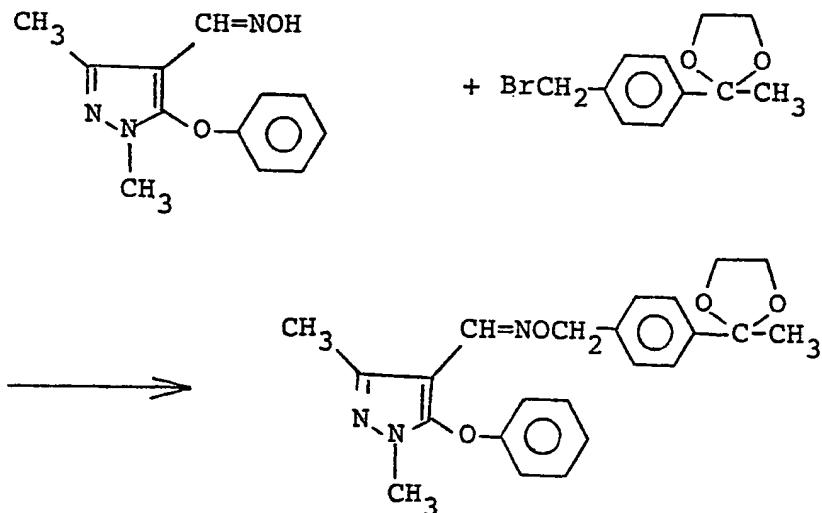


1.0 Gram (0.0040 mole) of 5-(4-fluorophenoxy)-

5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 1.0 g (0.0039 mole) of tert-butyl 4-bromomethylphenyl ketone and 1.0 g (0.0094 mole) of sodium carbonate were added to 40 ml of acetone, and the resulting mixture was heated to carry out reaction. After completion of the reaction, acetone was
10 removed by evaporation under reduced pressure, after which water was added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily
15 product was column-chromatographed on silica gel to obtain 1.5 g of the desired compound.

Yield 89%. n_{D}^{20} 1.5567.

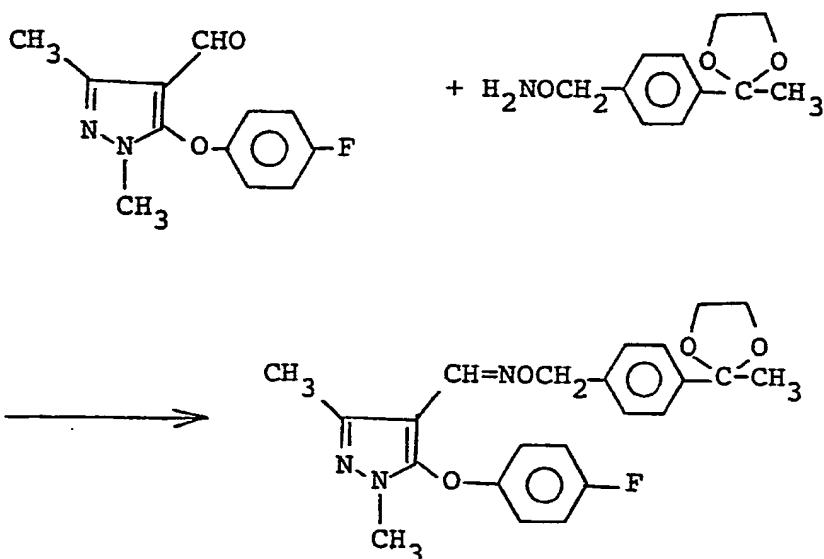
1 Example 35 2-Methyl-2-[4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneamino]methyl]phenyl]-1,3-dioxolane (compound No. 562)



- 1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxy-4-pyrazolecarbaldehyde oxime was dissolved in 20 ml of dioxane, and 0.14 g (0.0058 mole) of sodium hydride was added. Thereafter, 1.1 g (0.0043 mole) of 2-(4-bromomethylphenyl)-2-methyl-1,3-dioxolane was added to this solution which was then heated under reflux for 3 hours.
- After completion of the reaction, the reaction solution was poured into 200 ml of cold water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

Yield 74%. n_{D}^{20} 1.5698.

1 Example 36 2-[4-[{5-(4-Fluorophenoxy)-1,3-dimethylpyrazol-4-yl}methyleneaminoxymethyl]phenyl]-2-methyl-1,3-dioxolane (compound No. 563)



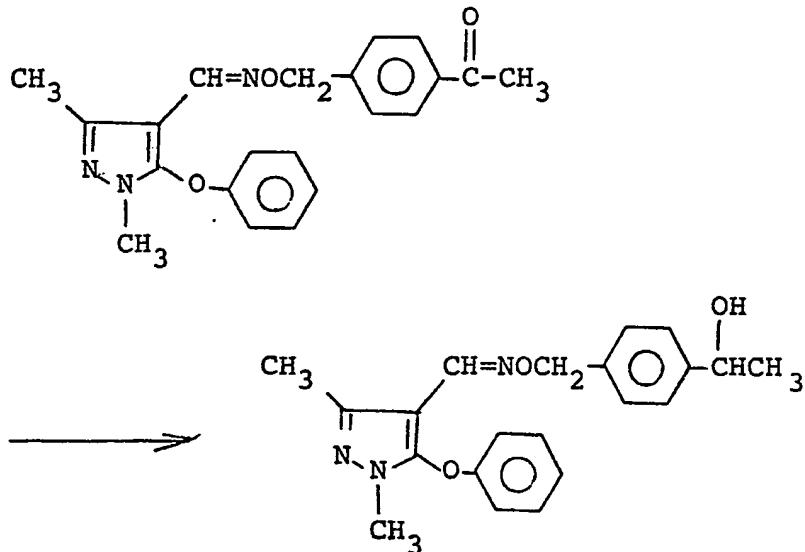
1.1 Gram (0.0043 mole) of 5-(4-fluorophenoxy)-

5 1,3-dimethylpyrazole-4-carbaldehyde and 0.9 g (0.0043 mole) of 2-[4-(aminooxymethyl)phenyl]-2-methyl-1,3-dioxolane were added to 20 ml of ethanol, and the resulting mixture was heated for 3 hours to carry out reaction.

After completion of the reaction, ethanol was removed by evaporation under reduced pressure, after which water was added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product 15 was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

Yield 72%. n_{D}^{20} 1.5555.

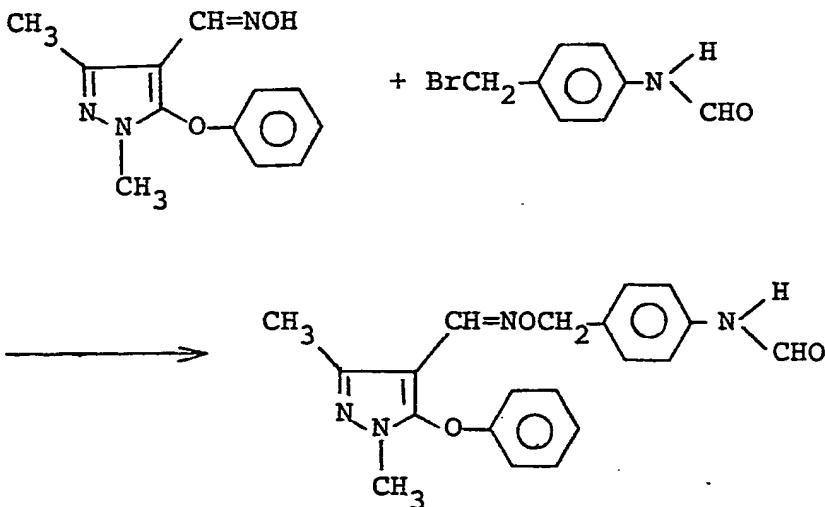
1 Example 37 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde oxime O-4-(1-hydroxyethyl)benzyl ether
(compound No. 584)



1.0 Gram (0.0028 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime-0-4-acetylbenzyl ether, 1.0 g (0.0026 mole) of sodium borohydride and 1 g (0.025 mole) of sodium hydroxide were added to 100 ml of methanol, and the resulting mixture was heated under reflux for 3 hours. After completion of the reaction, methanol was removed by evaporation under reduced pressure, after which water added to the residue and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 0.8 g of the desired compound.

Yield 78%. n_D^{20} 1.5748.

1 Example 38 N-4-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneamino]methyl]phenylformamide
(compound No. 589)

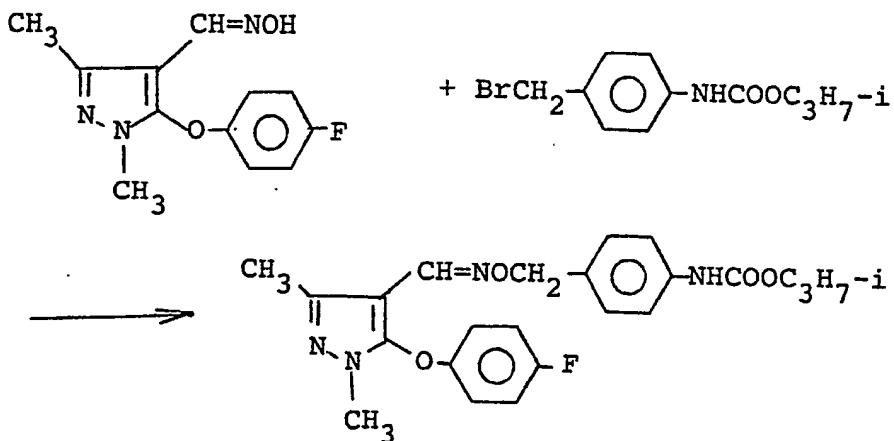


1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxy-4-pyrazole-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of powdery potassium hydroxide, the resulting solution was stirred. To this reaction solution was added 0.92 g (0.0043 mole) of N-(4-bromomethylphenyl)formamide, and reaction was carried out at room temperature for 3 hours.

After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.2 g of the desired compound.

Yield 76%. m.p. 105.3°C.

1 Example 39 Isopropyl N-4-[{5-(4-fluorophenoxy)-1,3-dimethylpyrazol-4-yl}methylenaminooxymethyl]-phenylcarbamate (compound No. 595)

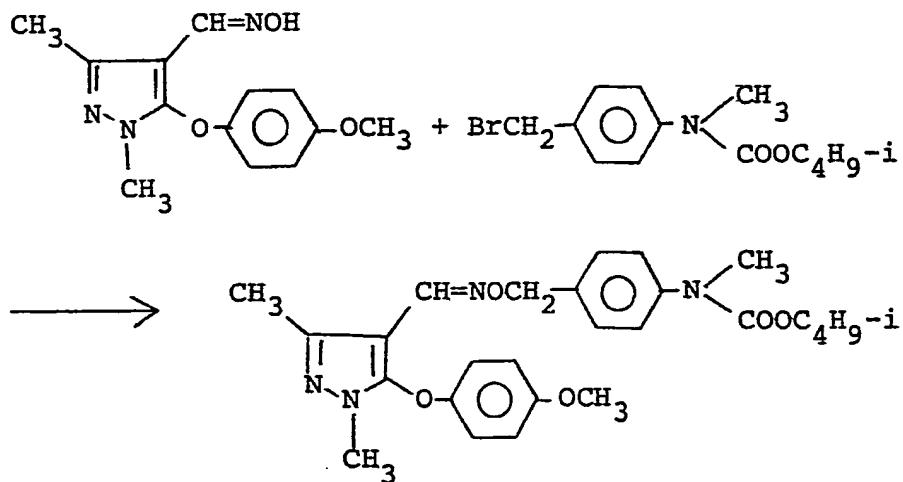


1.0 Gram (0.0040 mole) of 5-(4-fluorophenoxy)-

- 5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 1.1 g (0.0040 mole) of isopropyl N-4-bromomethylphenylcarbamate and 1.0 g (0.0072 mole) of potassium carbonate were added to 20 ml of acetonitrile, and the resulting mixture was heated under reflux for 6 hours. After completion of the reaction,
10 acetonitrile was removed by evaporation under reduced pressure, after which water was added and extraction was carried out with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This
15 oily product was column-chromatographed on silica gel to obtain 1.5 g of the desired compound.

Yield 85%. n_D^{20} 1.5645.

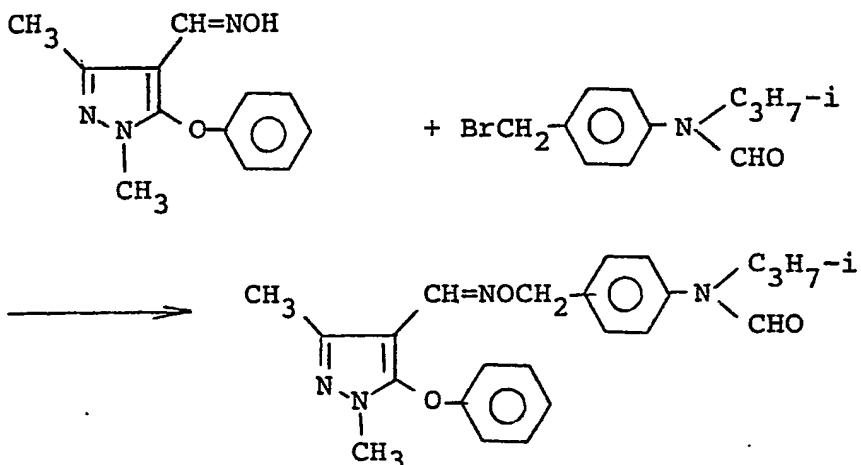
1 Example 40 Isobutyl N-4-[{5-(4-methoxyphenoxy)-
1,3-dimethylpyrazol-4-yl}methylenamino-
oxymethyl]phenylcarbamate (compound No. 617)



- 1.0 Gram (0.0038 mole) of 5-(4-methoxyphenoxy)-
5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 1.1 g (0.0038
mole) of isobutyl N-4-bromomethylphenyl-N-methylcarbamate
and 1.0 g (0.0094 mole) of sodium carbonate were added to
40 ml of acetone, and the resulting mixture was heated to
carry out reaction. After completion of the reaction,
10 acetone was removed by evaporation under reduced pressure,
after which water was added and extraction was carried out
with ethyl acetate. The ethyl acetate extract was washed
with water and dried, and ethyl acetate was removed by
15 evaporation to obtain an oily product. This oily product
was column-chromatographed on silica gel to obtain 1.5 g
of the described compound.

Yield 83%. n_{D}^{20} 1.5538.

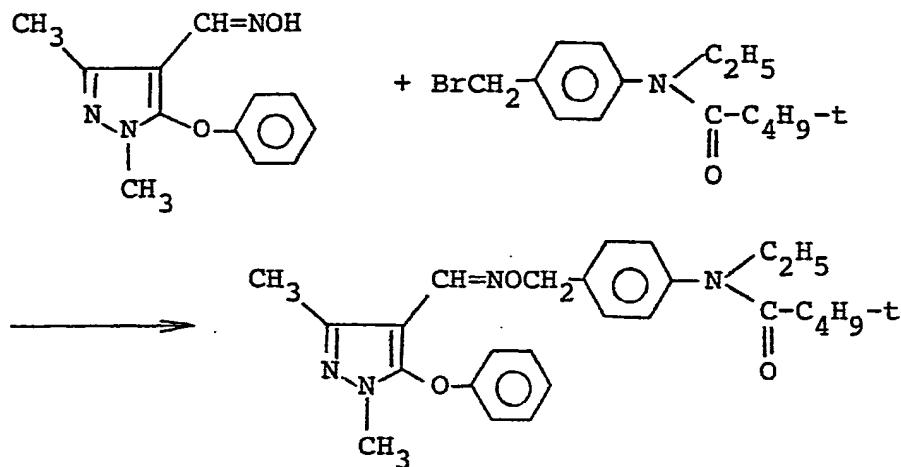
1 Example 41 N-4-[(1,3-dimethyl-5-phenoxyypyrazol-4-yl)
methyleneminooxymethyl]phenyl-N-
isopropylformamide (compound No. 636)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-
5 phenoxyypyrazole-4-carbaldehyde oxime was dissolved in 20 ml
of dioxane, and 0.1 g (0.0043 mole) of sodium hydride was
added to synthesize the sodium salt of said oxime. To this
reaction solution was added 1.1 g (0.0043 mole) of N-4-
bromomethylphenyl-N-isopropylformamide, and reaction was
10 carried out at from 40° to 50°C for 3 hours. After
completion of the reaction, the reaction solution was
poured into 200 ml of water and extracted with ethyl
acetate. The ethyl acetate extract was washed with water
and dried, and ethyl acetate was removed by evaporation to
15 obtain an oily product. This oil product was column-
chromatographed on silica gel to obtain 1.3 g of the
desired compound.

Yield 75%. m.p. 73.3°C.

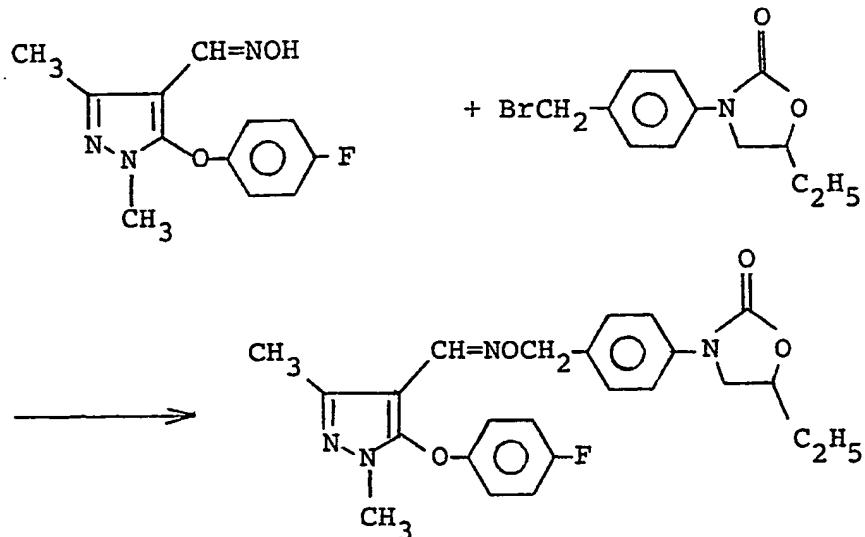
1 Example 42 N-4-[(1,3-dimethyl-5-phenoxyprazol-4-yl)-
methylenaminooxymethyl]phenyl-N-
ethylpivalamide (compound No. 647)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime, 1.3 g (0.0043 mole) of N-4-bromomethylphenyl-N-ethylpivalamide and 0.2 g (0.005 mole) of potassium hydroxide were dissolved in 30 ml of dimethyl sulfoxide, and reaction was carried out at from 40° to 50°C for 6 hours. After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.5 g of the desired compound.

Yield 78%. Form of product: paste.

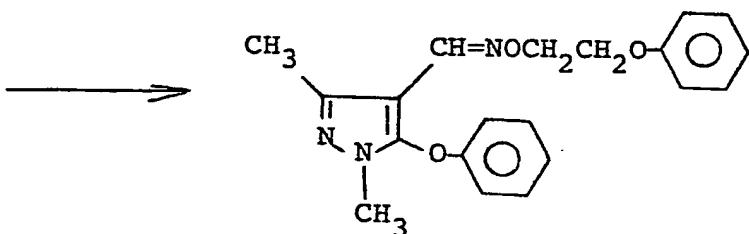
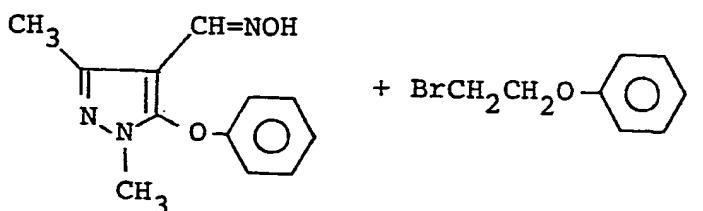
1 Example 43 5-Ethyl-3-[N-4[{5-(4-fluorophenoxy)-1,3-dimethylpyrazol-4-yl}methylenaminooxymethyl]phenyl]-2-oxazolidone (compound No. 657)



1.0 Gram (0.0040 mole) of 5-(4-fluorophenoxy)-
 5 1,3-dimethylpyrazole-4-carbaldehyde oxime and 1.1 g (0.0040
 mole) of 3-(4-bromomethylphenyl)-5-ethyl-2-oxazolidone
 were dissolved in 20 ml of dimethyl sulfoxide, and 0.3 g
 (0.0053 mole) of powdery potassium hydroxide was added.
 Reaction was then carried out at from 40° to 50°C for 5
 10 hours. After completion of the reaction, the reaction
 solution was poured into 200 ml of water and extracted with
 ethyl acetate. The ethyl acetate extract was washed with
 water and dried, and ethyl acetate was removed by
 evaporation to obtain an oily product. This oily product
 15 was column-chromatographed on silica gel to obtain 1.3 g of
 the desired compound.

Yield 72%. n_{D}^{20} 1.5601.

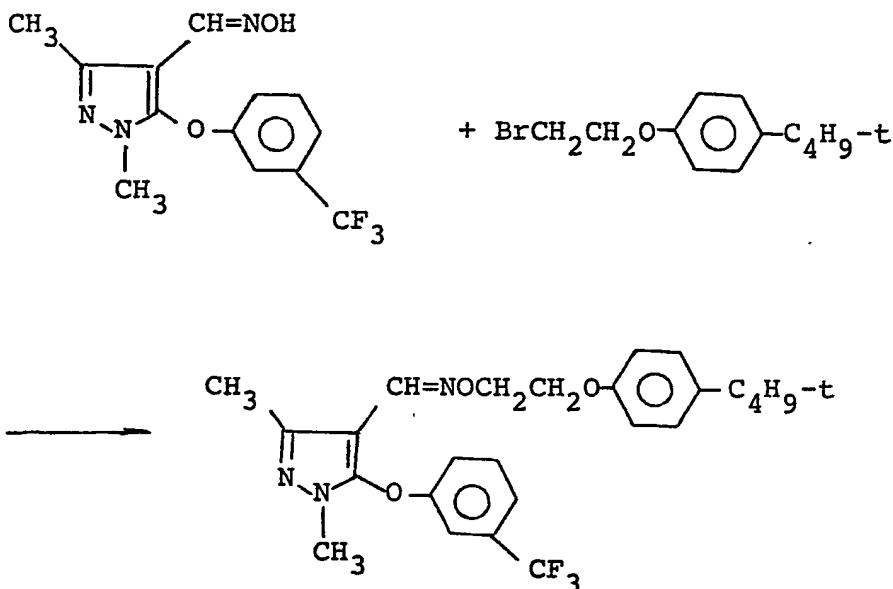
1 Example 44 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime 0-2-phenoxyethyl ether (compound No. 658)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of powdery potassium hydroxide, the resulting solution was stirred. To this solution was added 0.86 g (0.0043 mole) of 2-bromoethoxybenzene, and reaction was carried out at room temperature for 3 hours. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

Yield 86%. n_D^{20} 1.5657.

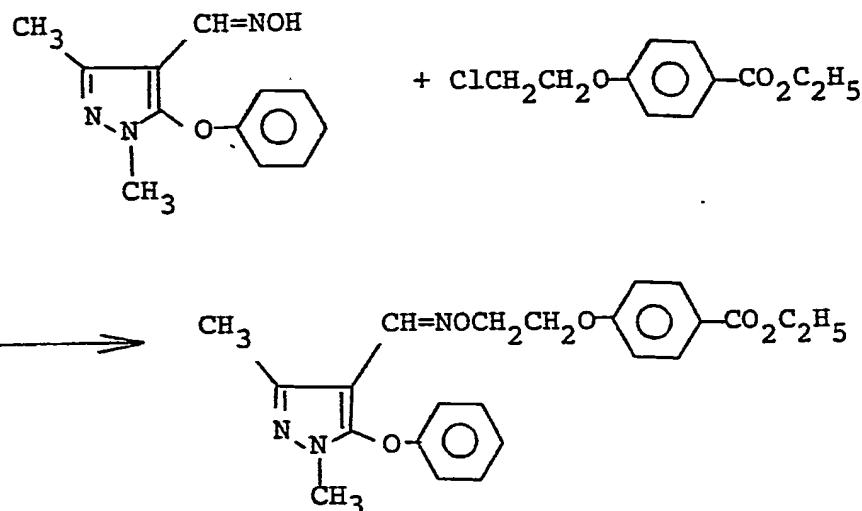
1 Example 45 1,3-Dimethyl-5-(3-trifluoromethylphenoxy)-
pyrazole-4-carbaldehyde oxime O-2-(4-tert-
butylphenoxy)ethyl ether (compound No. 671)



1.0 Gram (0.0030 mole) of 1,3-dimethyl-5-(3-
5 trifluoromethylphenoxy)pyrazole-4-carbaldehyde oxime,
0.86 g (0.0034 mole) of p-(2-bromoethoxy)-tert-butylbenzene
and 1.38 g of potassium carbonate were added to 50 ml of
acetonitrile, and the resulting mixture was heated under
reflux for 8 hours. After completion of the reaction,
10 water was added to the reaction solution which was then
extracted with ethyl acetate. The ethyl acetate extract
was washed with water and dried, and ethyl acetate was
removed by evaporation to obtain an oily product. This
oily product was column-chromatographed on silica gel to
15 obtain 1.4 g of the desired compound.

Yield 89%. n_D^{20} 1.5287.

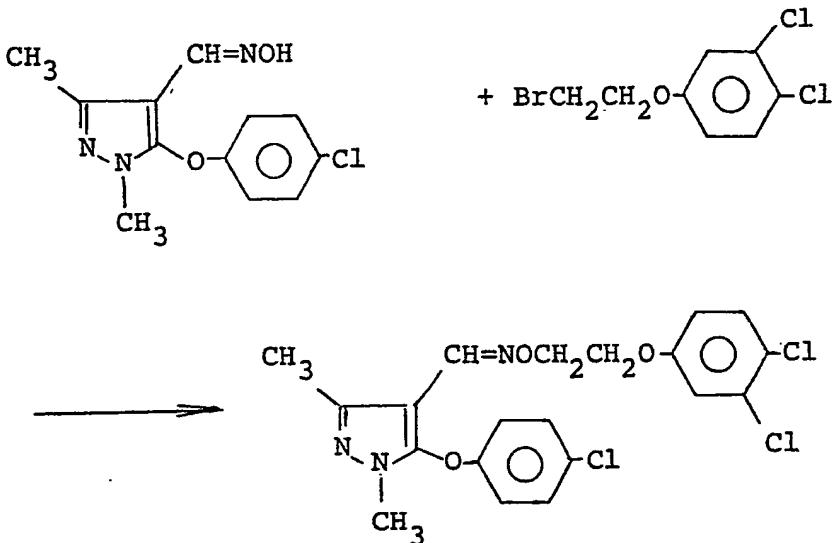
1 Example 46 Ethyl 4-[2-[(1,3-dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]ethoxy]benzoate
(compound No. 706)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxy-4-pyrazolecarbaldehyde oxime and 0.3 g (0.0075 mole) of powdery sodium hydroxide were added to 30 ml of dimethylformamide, and the resulting mixture was stirred. To this solution was added 0.99 g (0.0043 mole) of ethyl p-(2-chloroethoxy)benzoate, and reaction was carried out at 10 from 30° to 40°C for 3 hours. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an 15 oily product. This oily product was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

Yield 72%. n_D^{20} 1.5577.

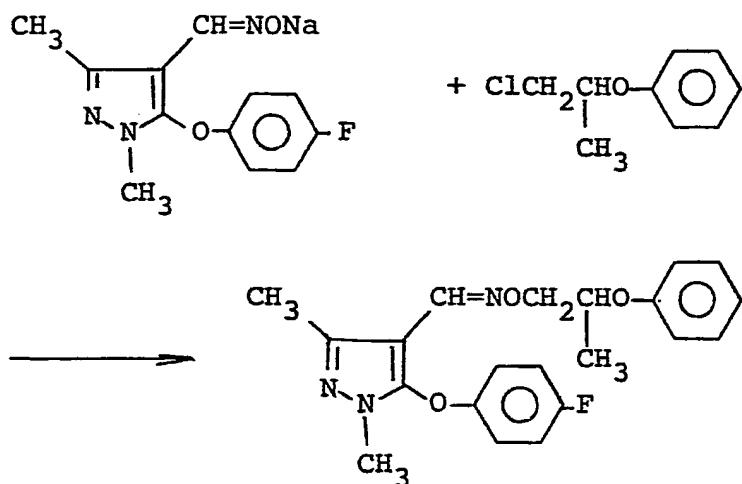
1 Example 47 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-2-(3,4-dichlorophenoxy)-ethyl ether (compound No. 723)



1.0 Gram (0.0038 mole) of 5-(4-chlorophenoxy)-5
5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 1.0 g (0.0038
mole) of 2-bromoethoxy-3,4-dichlorobenzene and 0.58 g
(0.0038 mole) of 1,8-diazabicyclo[5.4.0]-7-undecene were
dissolved in 50 ml of dioxane, and reaction was carried out
at from 60° to 80°C for 5 hours with stirring. After
10 completion of the reaction, water was added to the reaction
solution which was then extracted with ethyl acetate. The
ethyl acetate extract was washed with water and dried, and
ethyl acetate was removed by evaporation to obtain an oily
product. This oily product was column-chromatographed on
15 silica gel to obtain 1.5 g of the desired compound.

Yield 87%. n_D^{20} 1.5756.

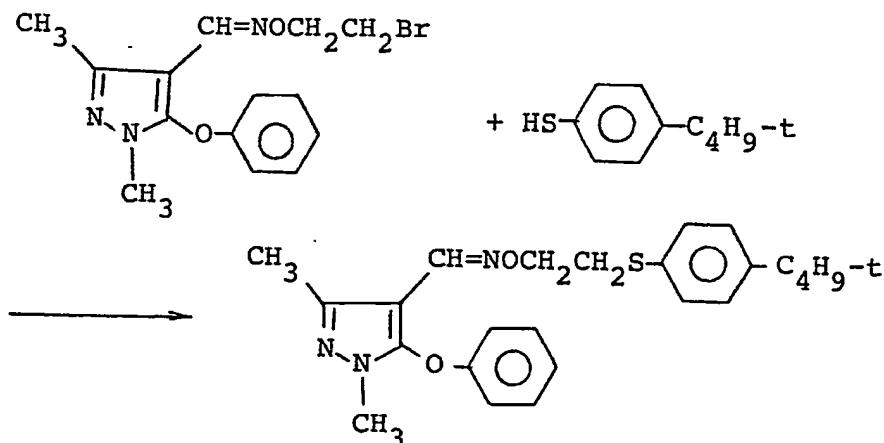
1 Example 48 5-(4-Fluorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime 0-2-phenoxypropyl ether
(compound No. 741)



1.0 Gram (0.0037 mole) of sodium 5-(4-
5 chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime
and 0.63 g (0.037 mole) of 2-chloro-1-methylethoxybenzene
were added to 50 ml of tetrahydrofuran, and the resulting
mixture was heated under reflux for 5 hours with stirring.
After completion of the reaction, water was added to the
10 reaction solution which was then extracted with ethyl
acetate. The ethyl acetate extract was washed with water
and dried, and ethyl acetate was removed by evaporation to
obtain an oily product. This oily product was column-
chromatographed on silica gel to obtain 1.3 g of the
15 desired compound.

Yield 87%. n_D^{20} 1.5484.

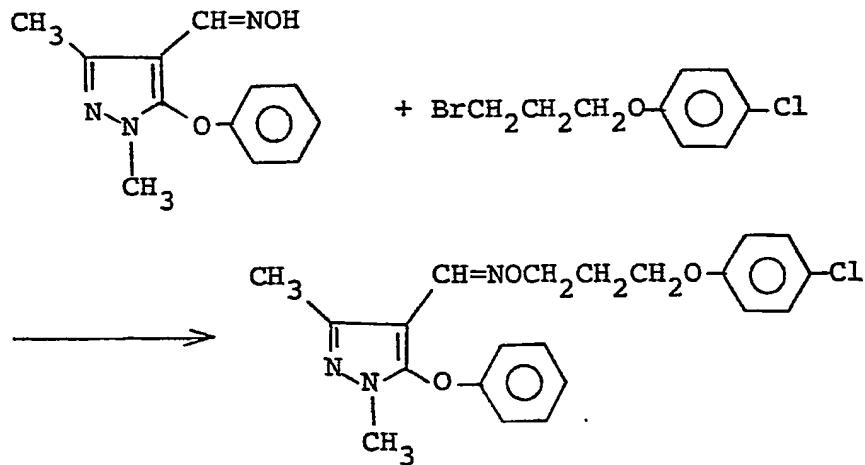
- 1 Example 49 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde oxime 0-2-(4-tert-butylphenylthio)ethyl ether
(compound No. 753)



1.0 Gram (0.0030 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime 0-2-bromoethyl ether,
0.5 g (0.0030 mole) of p-tert-butylbenzenethiol and 1.0 g (0.0072 mole) of potassium carbonate were added to 60 ml of acetonitrile, and the resulting mixture was heated under reflux for 5 hours. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.1 g of the desired compound.

Yield 87%. n_D^{20} 1.5775.

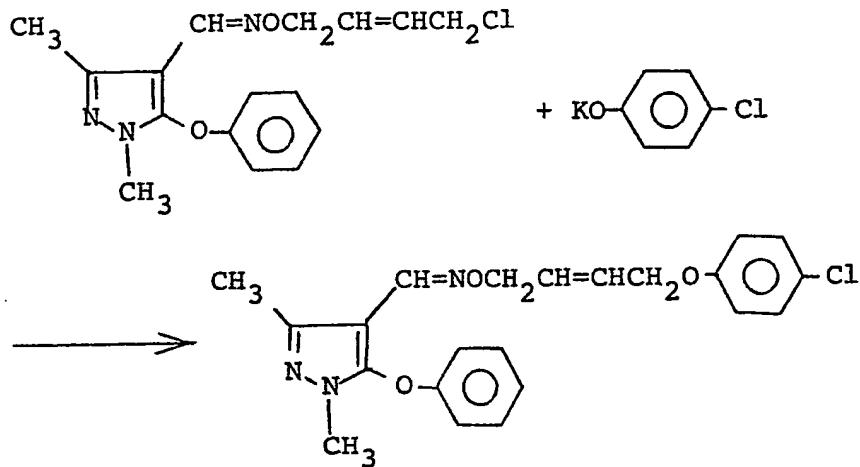
1 Example 50 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-3-(4-chlorophenoxy)propyl ether
(compound No. 761)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-
5 phenoxyprazole-4-carbaldehyde oxime and 0.3 g (0.0053
mole) of potassium hydroxide were added to 20 ml of
dimethyl sulfoxide, and the resulting mixture was stirred
for 1 hour. To this solution was added 1.07 g (0.0043
mole) of p-chloro-3-bromopropoxybenzene, and reaction was
10 carried out at from 40° to 50°C for 4 hours. After
completion of the reaction, water was added to the reaction
solution which was then extracted with ethyl acetate. The
ethyl acetate extract was washed with water and dried, and
ethyl acetate was removed by evaporation to obtain an oily
15 product. This oily product was column-chromatographed on
silica gel to obtain 1.3 g of the desired compound.

Yield 76%. n_D^{20} 1.5746

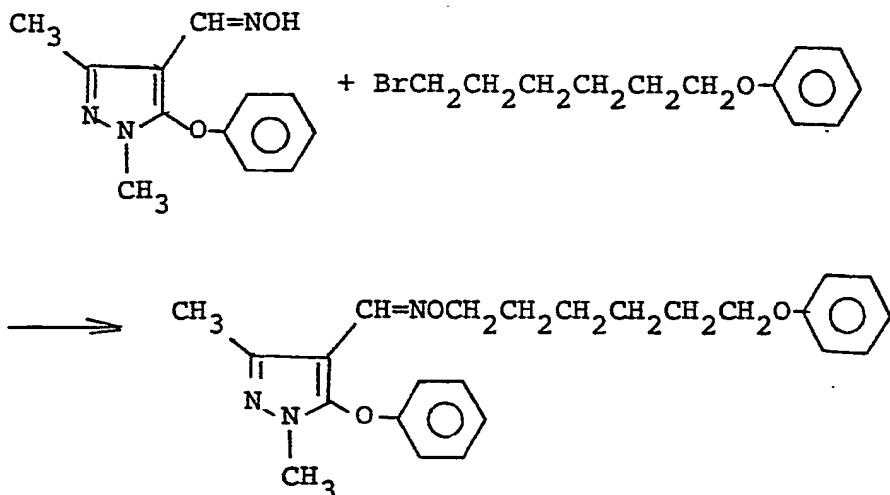
1 Example 51 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde oxime O-4-(4-chlorophenoxy)-2-butenyl ether
(compound No. 776)



1.0 Gram (0.0031 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime 0-4-chloro-2-butenyl ether and 0.6 g (0.0036 mole) of the potassium salt of p-chlorophenol were added to 50 ml of tetrahydrofuran, and the resulting mixture was heated under reflux for 3 hours with stirring. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.2 g of the desired compound.

Yield 93%. n_D^{20} 1.5712.

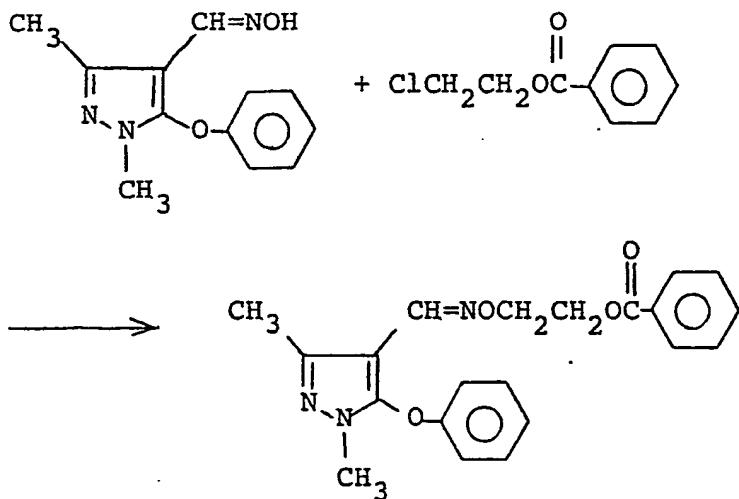
1 Example 52 1,3-Dimethyl-5-phenoxypyrazole-4-carbaldehyde
oxime O-6-phenoxyhexyl ether (compound No. 780)



- 1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxypyrazole-4-carbaldehyde oxime was dissolved in 10 ml of dimethyl sulfoxide, and after adding 0.11 g (0.0045 mole) of sodium hydride at room temperature, the resulting solution was stirred for 30 minutes. To this solution was added 1.1 g (0.0043 mole) of 6-bromohexyloxybenzene, and reaction was carried out at from 50° to 60°C for 3 hours.
- After completion of the reaction, water was added to the reaction solution which was then extracted with acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.4 g of the desired compound.

Yield 80%. n_{D}^{20} 1.5583.

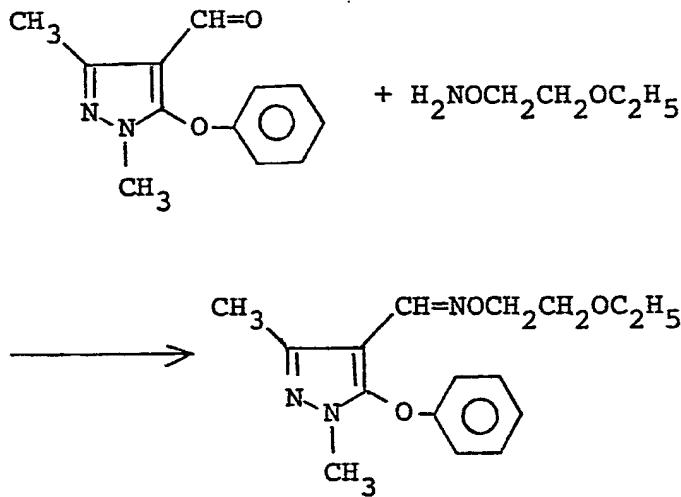
1 Example 53 2-[(1,3-Dimethyl-5-phenoxy)pyrazol-4-yl)methyleneaminoxy]ethyl benzoate
(compound No. 787)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxy-2-pyrazolecarbaldehyde oxime and 0.3 g (0.0054 mole) of powdery potassium hydroxide were added to 20 ml of dimethyl sulfoxide, and the resulting mixture was stirred for 30 minutes. To this solution was added 0.8 g (0.0043 mole) of 2-chloroethyl benzoate, and reaction was carried out at from 40° to 50°C for 3 hours. After completion of the reaction, water was added to the reaction solution which was then extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.3 g of the desired compound.

Yield 86%. n_D^{20} 1.5632.

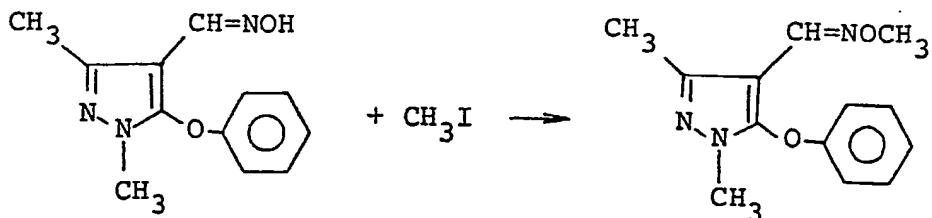
1 Example 54 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-2-ethoxyethyl ether (compound No. 789)



1.0 Gram (0.0046 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde was dissolved in 5 40 ml of ethanol, and 0.48 g (0.0046 mole) of O-(2-ethoxyethyl)hydroxylamine was added with stirring. Reaction was then carried out at room temperature for 3 hours. After completion of the reaction, water was added to the reaction solution which was then extracted with 10 ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.2 g of the desired compound.

15 Yield 86%. n_D^{20} 1.5407.

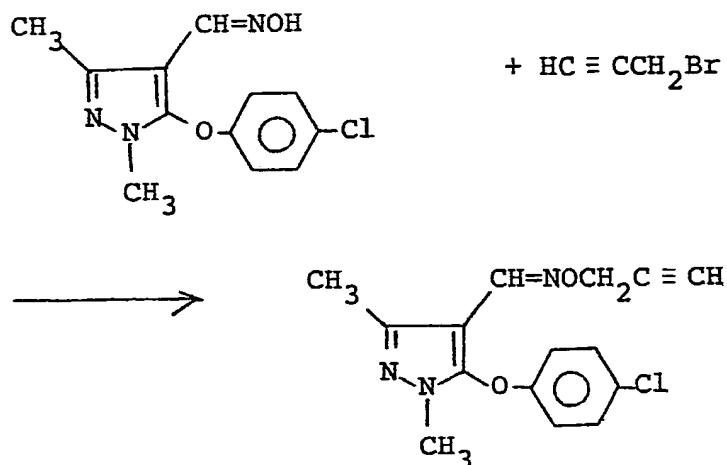
1 Example 55 1,3-Dimethyl-5-phenoxyprazole-4-carbaldehyde
oxime O-methyl ether (compound No. 790)



1.0 Gram (0.0043 mole) of 1,3-dimethyl-5-phenoxyprazole-4-carbaldehyde oxime was dissolved in 20 ml of dimethyl sulfoxide, and after adding 0.3 g (0.0053 mole) of powdery potassium hydroxide, the resulting mixture was stirred. To this reaction solution was added 1.0 g (0.0063 mole) of methyl iodide, and reaction was carried out at room temperature for 3 hours. After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation under reduced pressure to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 0.3 g of the desired compound.

Yield 76%. m.p. 70.2° C.

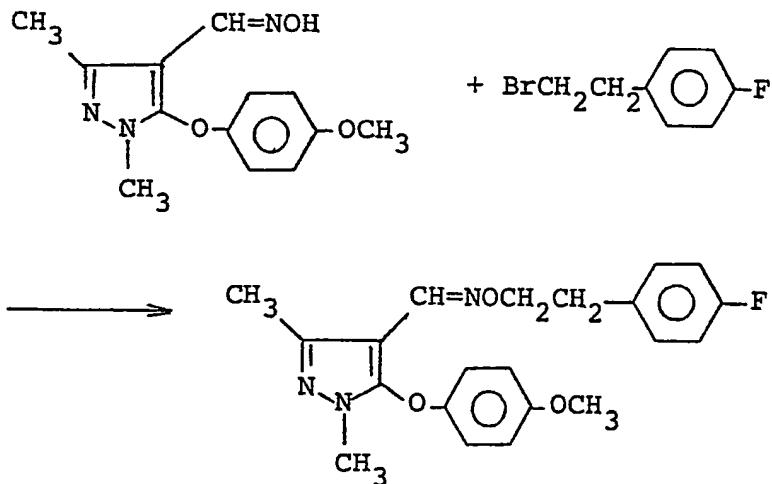
1 Example 56 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-2-propynyl ether (compound No. 795)



1.0 Gram (0.0033 mole) of 5-(4-chlorophenoxy)-5 1,3-dimethylpyrazole-4-carbaldehyde oxime, 0.5 g (0.0042 mole) of propargyl bromide and 1.0 g (0.0072 mole) of potassium carbonate were added to 50 ml of acetone, and the resulting mixture was heated under reflux. After completion of the reaction, the reaction solution was 10 poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation under reduced pressure to obtain an oily product. This oily product was column-chromatographed on silica gel to 15 obtain 0.9 g of the desired compound.

Yield 87%. n_D^{20} 1.5670.

1 Example 57 5-(4-Methoxyphenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime 0-2-(4-fluorophenyl)-ethyl ether (compound No. 815)

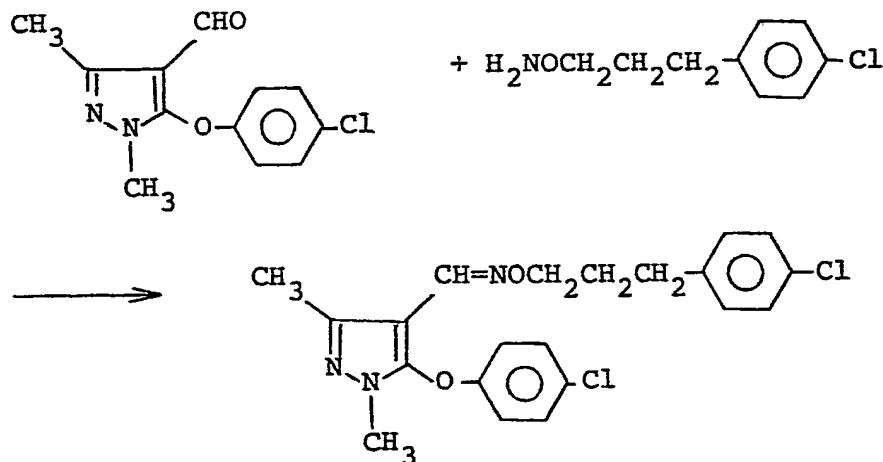


1.0 Gram (0.0038 mole) of 5-(4-methoxyphenoxy)-

5 1,3-dimethylpyrazole-4-carbaldehyde oxime was dissolved in 20 ml of dioxane, and after adding 0.1 g (0.0042 mole) of sodium hydride, the resulting mixture was stirred. To this reaction solution was added 0.78 g (0.0038 mole) of 2-(4-fluorophenyl)ethyl bromide, and reaction was carried
10 out at from 40° to 50°C for 3 hours. After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation under reduced pressure
15 to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.2 g of the desired compound.

Yield 82%. n_D^{20} 1.5588.

1 Example 58 5-(4-Chlorophenoxy)-1,3-dimethylpyrazole-4-carbaldehyde oxime O-3-(4-chlorophenyl)-propyl ether (compound No. 824)

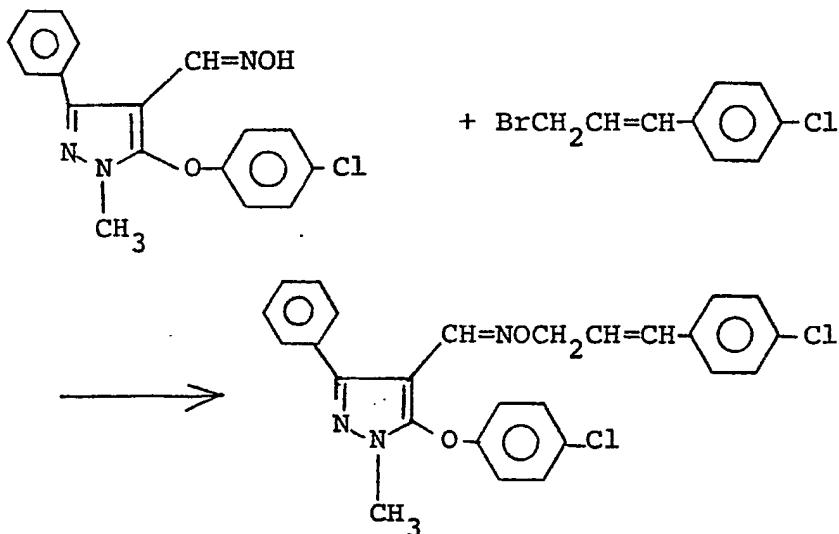


1.0 Gram (0.004 mole) of 5-(4-chlorophenoxy)-

5 1,3-dimethylpyrazole-4-carbaldehyde was dissolved
in 30 ml of methanol, and 0.74 g (0.004 mole) of
O-[3-(4-chlorophenyl)propyl]hydroxylamine was added at
room temperature with stirring. Reaction was then carried
out at from 40° to 50°C for 2 hours. Methanol was then
10 removed by evaporation under reduced pressure, after which
water was added to the residue and extraction was carried
out with ethyl acetate. The ethyl acetate extract was
washed with water and dried, and ethyl acetate was removed
by evaporation under reduced pressure to obtain an oily
15 product. This oily product was column-chromatographed on
silica gel to obtain 1.1 g of the desired compound.

Yield 66%. n_D^{20} 1.5751.

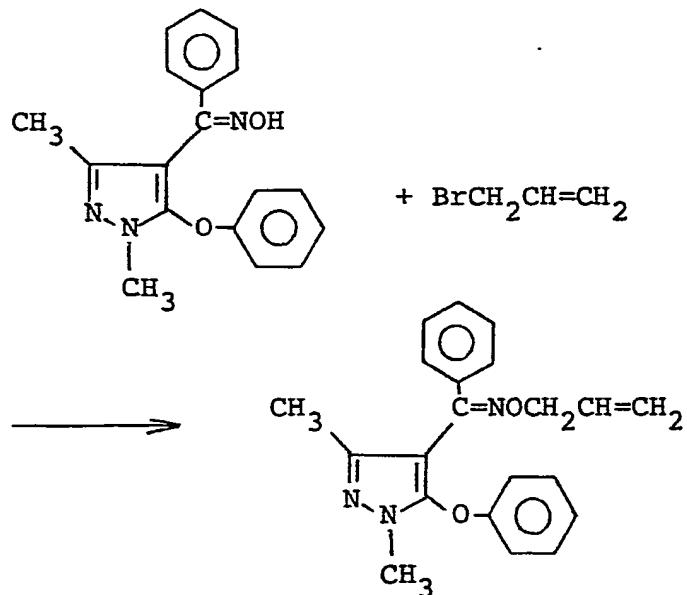
1 Example 59 5-(4-Chlorophenoxy)-1-methyl-3-phenylpyrazole-4-carbaldehyde oxime O-4-chlorocinnamyl ether (compound No. 846)



1.0 Gram (0.0030 mole) of 5-(4-chlorophenoxy)-1-5 methyl-3-phenylpyrazole-4-carbaldehyde oxime was reacted with 0.7 g (0.0030 mole) of p-chlorocinnamyl bromide and 0.2 g (0.005 mole) of sodium hydroxide at 30°C for 6 hours in 30 ml of dimethyl sulfoxide. After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation under reduced pressure to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 1.1 g of the desired compound.

Yield 76%. n_{D}^{20} 1.5980.

1 Example 60 1,3-Dimethyl-5-phenoxy-pyrazol-4-yl phenyl
ketone oxime O-allyl ether (compound No. 857)

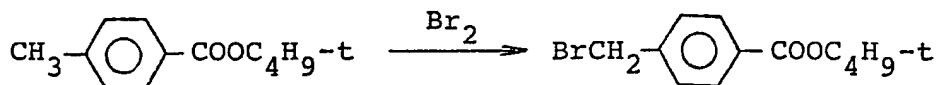


1.0 Gram (0.0033 mole) of 1,3-dimethyl-5-phenoxy-pyrazol-4-yl phenyl ketone oxime, 0.5 g (0.0041 mole) of allyl bromide and 1.0 g of potassium carbonate were added to 50 ml of acetone, and the resulting mixture was heated for 6 hours to carry out reaction. After completion of the reaction, the reaction solution was poured into 200 ml of water and extracted with ethyl acetate. The ethyl acetate extract was washed with water and dried, and ethyl acetate was removed by evaporation under reduced pressure to obtain an oily product. This oily product was column-chromatographed on silica gel to obtain 0.9 g of the desired compound.

15 Yield 79%. n_{D}^{20} 1.5800.

1 Synthesis of starting materials

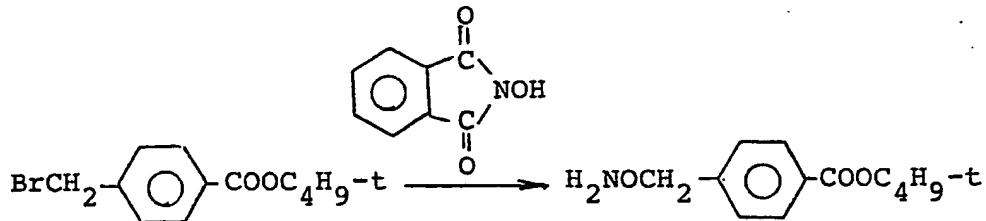
Synthetic example 1



13.2 Grams (0.006 mole) of tert-butyl 4-methylbenzoate, 0.3 g (0.0012 mole) of benzoyl peroxide and 6 g (0.006 mole) of sodium carbonate were suspended in 100 ml of carbon tetrachloride, and 9.6 g (0.06 mole) of bromine was added dropwise at 50°C over 30 minutes with stirring. After completion of the addition, reaction was continued for further 30 minutes. The reaction solution 10 was then cooled and filtered to remove carbon tetrachloride-insoluble matters. Carbon tetrachloride was then removed by evaporation under reduced pressure to obtain 16.2 g of tert-butyl 4-bromomethylbenzoate as crystals.

15 Yield 90%. m.p. 53.4°C .

Synthetic example 2

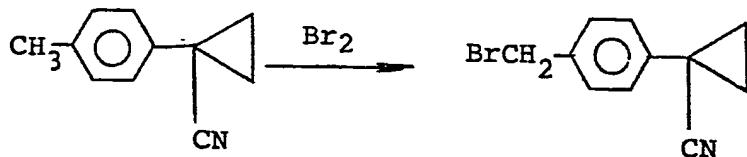


15.0 Grams (0.049 mole) of tert-butyl 4-bromomethylbenzoate, 8.2 g (0.05 mole) of N-hydroxyphthalimide and 3.0 g (0.054 mole) of potassium

1 hydroxide were added to 200 ml of dimethylformamide, and
 the resulting mixture was stirred at room temperature for
 30 minutes and then at 50°C for 30 minutes. The reaction
 solution was cooled with ice water and filtered to obtain
 5 crystals. The crystals were dissolved in 50 ml of
 methylene chloride, and to this solution was slowly added
 dropwise 3 ml of isopropanol containing 0.5 g (0.05 mole).
 of hydrazine hydrate at room temperature. After completion
 of the addition, the reaction solution was heated under
 10 reflux for 2 hours. The reaction solution was cooled and
 filtered, and the filtrate was concentrated to obtain
 11.0 g of tert-butyl 4-(aminoxymethyl)benzoate.

Yield 90%. $n_D^{15.6}$ 1.5296.

Synthetic example 3



15 3.0 Grams (0.02 mole) of 1-p-tolylcyclopropane-1-
 carbonitrile and 0.1 g (0.0004 mole) of benzoyl peroxide
 were dissolved in 50 ml of carbon tetrachloride, and 3.2 g
 of bromine was added dropwise over 30 minutes under reflux.
 After completion of the addition, reaction was continued
 20 for further 30 minutes. After cooling the reaction
 solution, carbon tetrachloride was removed by evaporation
 to obtain 4.4 g of 1-(4-bromomethylphenyl)cyclopropane-1-
 carbonitrile.

Yield 90%. Form of product: paste.

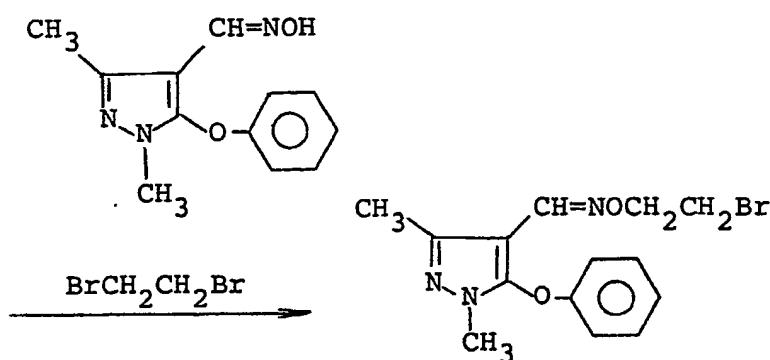
NMR:

δ (ppm) 1.15 - 1.40 (2H, m),

$$2.50 = 2.75 \text{ (2H, m),}$$

4.45 (1H, s), 7.35 (4H, s)

Synthetic example 4



5.0 Grams (0.00216 mole) of 1,3-dimethyl-5-phenoxyypyrazole-4-carbaldehyde oxime and 41.0 g (0.218 mole) of 1,2-dibromomethane were dissolved in 100 ml of
10 dimethyl sulfoxide, and after adding 14.4 g (0.219 mole) of 85% powdery potassium hydroxide with ice-cooling, the resulting solution was stirred for 30 minutes. After completion of the reaction, the reaction solution was poured into 300 ml of water, extracted with three 80-ml
15 portions of ether and washed with 300 ml of water. The ether extract was dried over anhydrous sodium sulfate, and ether was removed by evaporation. The residue was dry column-chromatographed on silica gel to obtain 5.2 g of 1,3-dimethyl-5-phenoxyypyrazol-4-carbaldehyde oxime
20 0-2-bromoethyl ether.

Yield 71.2%. n_D^{23.8} 1.5721.

1 The present invention provides a technique for
exterminating or controlling injurious insects and mites
using the physiological activity of the compounds of the
present invention. In one of the embodiments of the
5 invention, the compounds are directly applied as such to
the objects to be protected or to the pests to be
controlled (undiluted spray). For instance, the compounds
of the present invention in the form of a liquid of 95% or
higher purity can be sprayed from aeroplanes to form a fog
10 of extremely fine liquid particles.

The compounds of the present invention can also
be used to treat ponds and pools in which the larvae of the
insects live or treat environmental water or irrigative
water grown with hosts for the larvae to render the living
15 environment or feed (hosts) toxic to the larvae.

As is customary in the art, however, in order to
exterminate or control injurious insects and mites using
the physiological activity of the compounds of the present
invention, the compounds are applied in most cases in a
20 form suitable for use, for example, as supported on or
diluted with inert carriers and if necessary, mixed with
auxiliary agents.

General suggestions regarding the formulation of
insecticidal compositions with the compounds of the present
25 invention will be described below.

The compounds of the present invention are mixed
with a suitable proportion of suitable inert carriers
together with auxiliary agents if necessary to allow the

1 compounds to dissolve, disperse, suspend, mix, impregnate,
adsorb or adhere, and thus they are formed into suitable
preparations such as for example solutions, suspensions,
emulsifiable concentrates, oil sprays, wettable powders,
5 dusts, granules, tablets, pellets, pastes, aerosols, etc.

The inert carriers used in the formulation may be either solid or liquid. As examples of the solid carriers, there may be mentioned vegetable powders such as soybean flour, cereal flour, wood flour, bark flour, saw dust, 10 powdered tobacco stalk, powdered walnut shell, bran, powdered cellulose, and extraction residues of vegetables; fibrous materials such as paper, corrugated paperboard, and waste cloth; synthetic polymers such as powdered synthetic resins; inorganic or mineral products such as clays (e.g. 15 Kaolin, bentonite, and acid clay), talcs (e.g. talc and pyrophyllite), siliceous substances [e.g. diatomaceous earth, silica sand, mica, and "white carbon" (highly dispersed synthetic silicon dioxide, also called finely divided hydrated silica or hydrated silicon dioxide, some 20 commercial products containing calcium silicate as major constituent)], activated carbon, powdered sulfur, pumice, calcined diatomaceous earth, ground brick, fly ash, sand, calcium carbonate, and calcium phosphate; chemical fertilizers such as ammonium sulfate, ammonium nitrate, 25 urea, and ammonium chloride; and farmyard manure. These materials are used alone or in combination. Materials usable as liquid carriers are selected from those which will dissolve the active ingredients and those which do not

- 1 dissolve them, but can disperse them with the aid of adjuvants. For example, the following materials can be used alone or in combination: Water, alcohols (e.g. methanol, ethanol, isopropanol, butanol, ethylene glycol),
- 5 ketones (e.g. acetone, methyl ethyl ketone, methyl isobutyl ketone, diisobutyl ketone and cyclohexanone), ethers (e.g. ethyl ether, dioxane, cellosolves, dipropyl ether and tetrahydrofuran), aliphatic hydrocarbons (e.g. gasoline and mineral oils), aromatic hydrocarbons (e.g. benzene,
- 10 toluene, xylene, solvent naphtha and alkynaphthalenes), halohydrocarbons (e.g. dichloroethane, chlorinated benzenes, chloroform and carbon tetrachloride), esters (e.g. ethyl acetate, dibutyl phthalate, diisopropyl phthalate and dioctyl phthalate), acid amides (e.g. dimethylformamide,
- 15 diethylformamide and dimethylacetamide), nitriles (e.g. acetonitrile), and dimethyl sulfoxide.

Gaseous carriers include freons and other aerosol propellants which are a gas under normal conditions.

- The adjuvants, which are mentioned below, are
- 20 used according to individual purposes. In some cases, they are used in combination with one another. In some other cases, no adjuvant is used at all.

For the purpose of emulsification, dispersion, solubilization and/or wetting of the active ingredients,

- 25 there are used surface active agents such as for example polyoxyethylene alkylaryl ethers, polyoxyethylene alkyl ethers, polyoxyethylene higher fatty acid esters, polyoxyethylene resinates, polyoxyethylene sorbitan

1 monolaurate, polyoxyethylene sorbitan monooleate, alkylarylsulfonates, naphthalenesulfonic acid condensation products, ligninsulfonates and higher alcohol sulfate esters.

5 For the purpose of stabilizing the dispersion, tackification and/or agglomeration of the active ingredients, there may be used for example casein, gelatin, starch, alginic acid, methylcellulose, carboxymethylcellulose, gum arabic, polyvinyl alcohol, turpentine oil, rice bran oil, bentonite and ligninsulfonates.

For the purpose of improving the flow property of the solid compositions, it is recommendable to use waxes, stearates or alkyl phosphates.

As peptizers for dispersible compositions, it
15 is also recommendable to use naphthalenesulfonic acid condensation products and polyphosphates.

It is also possible to add a defoamer such as for example a silicone oil.

The content of the active ingredient may be
20 adjusted as occasion demands. For the preparation of powdered or granulated products, the content is usually from 0.5 to 20% by weight, and for the preparation of emulsifiable concentrates, suspension concentrates or wettable powders, it is preferably from 0.1 to 50% by weight.

For controlling various insects, mites and fungi, inhibiting their growth and protecting useful plants from damage caused by these insects, mites and

1 fungi, the compositions of the present invention for
use in agriculture and horticulture are applied in
insecticidally, acaricidally or fungicidally effective
amounts. In applying the present compositions, they
5 are applied, as such or after properly diluted with or
suspended in water or other suitable medium, to soil or
the foliage of crops to be protected from the attack of
insects, mites and fungi.

The amount of the active ingredient used
10 depends upon various factors such as for example the
purpose of application, growth state of crops, weather,
environmental conditions, the form of the composition,
the mode of application, the type of fields to be
treated, and the like.

15 In applying the present fungicidal compositions
alone, the dosage of the present active ingredient is
preferably selected from a range of from 0.1 to 500 g per
10 ares.

Furthermore, the present compounds can be
20 applied in the form of mixed formulations with other
fungicides, insecticides, fertilizers and plant growth
regulators, as far as such agents can be used in combi-
nation with the present compounds.

Examples of pesticides usable in admixture
25 with the insecticide of the present invention will be
shown below:

O,O-dimethyl O-(4-nitro-3-methylphenyl)-
thiophosphate (Phenitrothion)

- 1 O,O-dimethyl O-(3-methyl-4-methylthiophenyl)-
thiophosphate (Baycid)

 O,O-dimethyl S-(carbethoxyphenylmethyl)-
dithiophosphate (Elsan)

5 O,O-diethyl O-(2-isopropyl-4-methylpyrimidyl-6)-
thiophosphate (Diazinon)

 O,O-dimethyl 2,2,2-trichloro-1-hydroxyethyl-
phosphate (Dipterex).

 O-ethyl O-p-cyanophenyl phenylphosphonothioate
10 (Surecide)

 O-ethyl O-p-nitrophenyl phenylthiophosphonate
(EPN)

 O,O-dipropyl O-4-methylthiophenylphosphate
(Propaphos)

15 O,O-dimethyl S-phthalimidomethyl dithiophosphate
(Imidan)

 O,O-dimethyl O-dichlorovinyl phosphate (DDVP)
 O,O-dimethyl S-(N-methylcarbamoylmethyl)-
dithiophosphate (Dimethoate)

20 O,O-dimethyl S-(1,2-dicarbethoxyethyl)-
dithiophosphate (Malathon)

 1-Naphthyl N-methylcarbamate (NAC)
 m-Tolyl N-methylcarbamate (MTMC)
 2-Isopropoxyphenyl N-methylcarbamate (PHC)

25 Ethyl N-(diethyl-dithiophosphorylacetyl)-N-
methylcarbamate (Mecarbam)

 3,4-Xylyl N-methylcarbamate (MPMC)
 2-s-Butylphenyl N-methylcarbamate (BPMC)

- 1 2-Isopropylphenyl N-methylcarbamate (MIPC)
 2-Chlorophenyl N-methylcarbamate (CPMC)
 3,5-Xylyl N-methylcarbamate (XMC)
 2-(1,3-Dioxolan-2-)phenyl N-methylcarbamate

5 (Dioxacarb)
 3-tert-Butylphenyl N-methylcarbamate (Terbam)
 4-Diallylamino-3,5-dimethylphenyl N-methyl-
 carbamate (APC)
 S-methyl-N-(methylcarbamoyloxy) thioacetooimide

10 (Methomil)
 N-(2-methyl-4-chlorophenyl)-N,N-dimethyl-
 formamidine hydrochloride (Chlorophenamidine)
 1,3-Bis(carbamoylthio)-2-(N,N-dimethylamino)-
 propane hydrochloride (Cartap)

15 Diisopropyl-1,3-dithiolan-2-ylidene malonate
 (Isoprothiolan)
 N-[[(4-chlorophenyl)amino]carbonyl]-2,6-
 difluorobenzamide (Diflubenzuron)
 O,O-Dimethyl-S-[2-(isopropylthio)ethyl]-

20 phosphorodithioate (Isothioate)
 O,O-Diethyl-S-[2-(ethylthio)ethyl]-phos-
 phorodithioate (Disulfoton)
 2,3-Dihydro-2,2-dimethylbenzofuran-7-yl
 methylcarbamate (Carbofuran)

25 O-Ethyl S,S-diphenyl phosphorodithioate
 (Edibenfos)
 N-(trichloromethylthio)cyclohex-4-ene-1,2-
 dicarboxamide (Captan)

1 2,4,5,6-Tetrachloro-1,3-isophthalonitril

(Chlorothalonil)

N-(1,1,2,2-tetrachloroethylthio)cyclohex-4-
ene-1,2-dicarboxamide (Captafol)

5 Dimethyl 4,4-o-phenylene bis(3-thioallophanate)

(Thiophanate methyl)

Methyl 3-(butylcarbamoyl)-3H-benzimidazol-2-
ylcarbamate (Benomyl)

Zinc ethylenebis(dithiocarbamate) (polymeric)

10 (Zineb)

Manganese ethylenebis(dithiocarbamate) (poly-
meric) (Maneb)

In order to demonstrate the effectiveness of
the present compounds, some test examples and formulation
15 examples will be shown below, but the present invention
is not limited to these examples only.

Test example 1 Fungicidal activity against the powdery
mildew of barley (Erysiphe graminis f.

20 sp. hordei)

Barley seedlings at 2-leaf stage were sprayed
with test compound (200 ppm) one day after inoculation
with conidia of Erysiphe graminis f. sp. hordei. The
seedlings were kept in a constant-temperature room at
25 25°C for one week and the percentage of the infected
area per leaf was examined. The fungicidal activity
was judged based on the following criterion in
comparison with the untreated plot.

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1

The results are shown in Table 2.

A : Control of disease 100 - 95%

B : Control of disease 94 - 80%

C : Control of disease 79 - 60%

D : Control of disease 59 - 0%

Table 2

Compound No.	Fungicidal activity	Compound No.	Fungicidal activity	Compound No.	Fungicidal activity
4	B	55	A	97	C
9	C	56	A	98	A
16	B	57	C	102	A
17	A	58	C	103	C
18	B	59	A	105	A
19	A	60	A	109	A
20	B	66	A	110	B
21	A	67	A	111	A
22	A	68	A	112	A
23	A	69	A	113	A
24	A	71	B	114	A
25	A	73	A	118	B
26	A	74	A	119	C
27	A	85	A	120	B
33	A	86	A	123	A
34	A	87	A	124	B
35	A	88	A	133	A
36	A	89	A	134	B
41	A	90	A	136	A
42	A	91	A	140	B
50	A	92	A	142	C
51	A	93	B	144	C
52	B	94	A	145	A
53	A	95	B	153	A
54	A	96	C	154	A

- Con't -

Table 2 (Cont'd)

155	A	212	A	249	C
156	A	213	A	250	A
157	A	216	A	251	B
158	A	217	B	252	A
159	A	219	C	253	A
160	A	220	A	254	A
161	B	221	A	255	A
167	A	222	C	257	B
181	C	228	B	258	B
186	B	229	A	262	B
188	A	230	A	263	A
190	C	231	A	264	A
193	A	232	A	265	A
194	A	234	A	266	A
195	A	235	A	267	A
197	A	236	C	268	A
198	A	237	A	269	B
199	A	238	C	270	B
200	A	239	A	281	B
201	A	240	A	282	C
202	A	241	A	283	A
203	A	242	A	300	C
204	B	243	A	302	B
205	A	245	A	303	B
206	C	246	B	304	B
207	C	248	A	305	B

- Cont'd -

Table 2 (Cont'd)

306	A	351	A	391	A
309	B	352	B	392	A
311	C	353	A	393	A
312	B	356	A	394	A
315	A	357	A	395	A
316	A	358	A	396	A
321	A	363	A	397	A
323	A	364	A	398	A
324	C	365	A	399	A
328	B	366	A	400	A
329	A	369	A	401	A
330	A	370	A	402	A
331	A	371	C	403	A
332	A	372	A	404	A
333	A	373	C	405	A
334	A	374	A	406	A
336	B	375	A	407	A
337	B	382	A	409	A
340	A	383	A	421	A
342	A	384	A	422	A
343	A	385	A	424	A
344	A	386	A	427	A
346	A	387	A	428	A
347	A	388	C	429	A
349	B	389	A	431	A
350	A	390	A	432	B

- Cont'd -

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Table 2 (Cont'd)

433	A	470	B	496	A
434	A	471	A	497	A
435	B	472	A	498	A
436	A	473	A	499	A
437	A	474	A	501	A
438	A	475	B	502	A
439	A.	476	A	503	A
440	A	477	A	504	A
441	A	478	B	505	A
443	A	479	A	506	A
444	A	480	A	507	A
445	A	481	A	508	A
446	A	482	A	518	C
447	A	483	A	522	B
448	A	484	A	523	B
449	A	485	A	524	B
450	A	486	A	527	A
451	A	487	A	528	A
452	A	488	B	529	B
453	A	489	B	530	B
454	A	490	B	532	A
455	A	491	C	533	A
465	A	492	B	534	C
466	A	493	A	535	B
468	A	494	A	536	A
469	A	495	A	537	B

- Cont'd -

Table 2 (Cont'd)

538	A	574	B	612	A
541	A	576	A	613	A
545	A	578	B	614	A
546	A	579	B	615	A
547	A	580	B	616	A
548	A	581	C	617	A
549	B	584	B	618	A
550	C	586	C	619	A
551	B	587	B	620	A
552	C	589	A	621	A
553	A	591	B	622	A
554	C	592	A	623	A
555	C	593	B	624	A
556	B	594	B	625	A
557	A	595	C	626	A
562	A	596	C	627	B
563	A	597	C	628	B
565	A	598	C	629	A
566	A	601	C	630	A
567	A	602	A	631	A
568	A	603	A	636	A
569	B	604	A	637	A
570	A	608	A	638	A
571	A	609	A	639	A
572	B	610	A	640	A
573	B	611	A	641	B

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Table 2 (Cont'd)

642	C	677	A	727	A
643	A	678	A	729	A
644	B	680	A	730	B
645	A	682	A	731	B
646	A	683	A	732	A
648	A	684	A	733	A
649	A	691	B	737	A
650	B	692	B	739	C
652	C	693	A	740	A
653	B	694	A	741	A
654	B	695	A	746	B
655	A	696	B	751	B
656	B	697	B	753	B
657	B	700	C	754	A
658	A	701	A	755	A
659	B	702	B	757	A
660	A	707	B	758	A
661	B	708	A	759	A
662	B	713	A	763	B
663	A	715	A	766	A
667	C	716	B	767	A
668	A	718	C	768	A
670	A	719	A	769	A
672	B	720	B	772	B
675	B	724	A	773	A
676	B	726	B	775	B

- Cont'd -

Table 2 (Cont'd)

783	B	823	A	841	B
784	B	824	A	842	A
795	A	825	A	843	A
796	B	827	B	844	A
803	A	828	C	848	A
804	C	829	A	849	A
805	C	831	C	850	A
816	A	833	B	851	A
817	A	834	A	852	B
818	A	835	B	853	A
819	A	836	A	854	C
821	B	839	A	855	A
822	B	840	B		

1 Test example 2 Fungicidal activity against the crown rust
of oat (Puccinia coronata f.sp. avenae)

Oat seedling at 8-leaf stage were sprayed with
test compound (200 ppm) one day after inoculation with
5 uredospores of Puccinia coronata f.sp. avenae. The
seedlings were kept in a constant-temperature room at 25°C
for ten days and the percentage of the infected area per
leaf was examined. The fungicidal activity was judged
according to the same criterion as in Test example 1.

10 The results are shown in Table 3.

Table 3

Compound No.	Fungicidal activity	Compound No.	Fungicidal activity	Compound No.	Fungicidal activity
14	B	60	A	111	A
18	C	66	A	112	A
19	C	67	A	113	A
21	C	68	A	114	A
22	B	69	A	133	A
23	B	71	A	134	A
24	B	73	A	135	B
25	B	74	A	136	A
27	A	85	A	138	A
33	A	86	A	139	A
34	A	87	A	140	A
35	A	88	B	142	A
36	A	89	A	143	A
41	A	90	A	144	A
42	A	91	A	145	A
50	A	92	C	153	A
51	A	93	B	154	A
52	A	94	B	155	A
53	A	95	A	156	A
54	A	96	A	157	A
55	A	97	C	158	A
56	A	98	A	159	B
57	A	105	A	160	B
58	A	109	A	161	A
59	A	110	A	186	A

Table 3 (Cont'd)

188	A	241	A	328	A
193	A	242	B	329	A
194	A	243	A	330	A
195	A	245	A	331	A
198	A	246	A	332	A
199	A	248	C	333	A
200	A	250	A	337	A
201	B	251	A	340	B
202	C	254	B	342	A
203	A	257	A	343	A
204	B	258	A	344	A
205	B	263	A	345	B
212	A	264	A	346	A
213	C	265	A	347	A
217	C	266	B	349	A
220	B	267	B	350	A
221	A	268	B	351	B
228	B	283	B	353	A
229	A	303	C	355	B
230	A	305	B	356	A
231	A	306	A	357	A
234	A	309	C	358	A
237	A	312	A	363	A
238	B	315	A	364	A
239	A	316	A	366	A
240	A	323	B	369	A

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Table 3 (Cont'd)

370	A	402	A	446	C
371	A	403	A	447	A
372	A	404	A	448	A
373	A	405	A	449	A
374	A	406	A	450	A
375	A	407	A	451	A
381	C	409	A	452	A
382	A	421	A	453	A
383	A	422	A	454	A
384	A	427	C	455	A
385	A	428	A	465	A
386	A	429	A	468	A
387	B	431	A	469	A
388	C	433	A	470	A
390	A	434	A	471	A
391	A	435	B	472	A
392	A	436	A	473	A
393	A	437	A	474	A
394	A	438	C	475	A
395	A	439	A	476	B
396	A	440	A	477	A
397	A	441	A	478	A
398	A	442	A	479	A
399	A	443	B	480	A
400	A	444	A	481	C
401	A	445	B	482	A

- Cont'd -

Table 3 (Cont'd)

483	A	523	A	557	A
484	A	524	A	558	C
485	A	525	A	559	C
486	A	527	C	560	B
487	A	528	A	561	A
488	A	529	A	562	B
489	A	530	A	563	A
490	A	531	A	565	A
491	A	532	A	566	A
492	A	533	A	567	A
493	A	534	A	568	A
494	A	535	A	569	A
495	A	536	A	570	A
496	A	537	A	571	A
497	A	538	A	572	A
498	A	544	B	573	C
499	A	545	A	574	B
500	C	546	A	576	A
501	A	548	A	577	A
502	A	550	C	578	A
503	A	551	A	579	A
504	A	552	C	580	A
505	A	553	B	585	C
506	A	554	A	586	A
507	A	555	A	587	A
508	A	556	A	589	A

- Cont'd -

Table 3 (Cont'd)

590	A	621	A	651	B
591	A	622	A	652	A
592	A	623	A	653	B
593	A	624	A	654	A
594	A	625	A	655	A
595	A	626	A	656	A
596	B	627	A	657	A
599	B	628	A	658	A
602	A	629	A	659	B
603	A	630	A	660	A
604	A	631	A	661	A
606	C	636	A	662	A
607	A	637	A	663	A
608	A	638	A	667	C
609	A	639	A	668	A
610	A	640	A	669	B
611	A	641	A	670	B
612	A	642	A	672	B
613	A	643	A	674	B
614	A	644	A	675	A
615	A	645	A	677	A
616	A	646	A	678	A
617	A	647	A	679	B
618	A	648	A	680	A
619	A	649	A	682	A
620	A	650	A	683	A

- Cont'd -

Table 3 (Cont'd)

684	A	727	A	784	B
685	A	729	A	794	C
690	C	730	A	796	A
691	C	731	A	804	A
692	A	732	A	812	B
693	A	733	A	813	A
694	A	737	B	814	B
695	A	746	B	815	B
696	A	751	B	817	C
697	A	755	A	821	A
699	A	757	B	822	C
701	A	758	A	823	A
706	B	759	A	824	A
709	A	763	A	825	A
710	A	764	B	829	A
711	A	766	A	830	C
712	A	767	A	831	A
713	B	768	A	832	C
715	B	769	A	833	A
717	C	770	B	834	A
719	A	772	A	835	A
720	C	773	A	838	A
723	B	780	B	842	A
724	A	781	C	843	A
725	A	782	A	844	A
726	A	783	B	848	A

- Cont'd -

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Table 3 (Cont'd)

849	B	851	A	853	A
850	A	852	B	854	A

1 Test example 3 Fungicidal activity against the downy
mildew of cucumber (Pseudoperonospora cubensis)

Cucumber plants at 2-leaf stage were sprayed with test compound (200 ppm) one day before inoculation with 5 zoospores of Pseudoperonospora cubensis. After the plants were kept in a humid room at 25°C one day and then in a greenhouse for six days, the degree of infection per leaf was examined and the fungicidal activity was judged according to the same criterion as in Test example 1.

10

The results are shown in Table 4.

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Table 4

Compound No.	Fungicidal activity	Compound No.	Fungicidal activity	Compound No.	Fungicidal activity
4	B	51	B	90	A
9	A	52	B	91	A
10	B	53	C	92	A
12	C	54	A	93	A
13	B	55	A	94	A
16	C	56	A	95	A
17	A	57	A	96	A
18	C	58	C	97	A
19	A	59	C	98	A
20	B	60	A	99	A
21	A	65	C	100	A
22	A	66	A	101	A
23	A	67	A	102	A
24	A	68	A	103	B C
25	A	69	B	104	B
26	A	73	C	105	B
27	A	74	A	109	A
33	A	75	B	110	A
34	A	77	B	111	A
36	A	78	A	112	B
41	A	79	C	113	A
42	A	85	A	114	A
45	A	86	B	115	A
47	C	87	A	116	A
50	A	88	C	117	B

- Con't -

Table 4 (Cont'd)

118	B	179	A	228	B	
121	C	180	A	229	B	
122	A	181	C	230	B	
123	B	182	A	231	C	
130	A	183	B	232	B	
131	A	186	C	234	A	
133	C	188	A	237	A	
136	A	192	A	239	C	
137	B	193	A	240	A	
138	B	194	A	242	C	
139	A	195	B	243	A	
140	A	196	B	245	A	
141	C	197	A	246	B	
145	B	198	A	251	C	
147	A	199	A	252	B	
153	B	200	A	253	A	
154	A	201	B	254	A	
155	A	202	B	255	B	
156	A	203	A	256	B	
159	C	204	A	257	C	
160	B	205	A	258	C	
161	A	212	A	262	C	
162	A	213	A	263	C	
171	C	216	C	264	C	
173	A	220	B	265	A	
178	A	221	A	266	B	

- Cont'd -

Table 4 (Cont'd)

267	C	336	A	376	B
269	B	337	B	377	B
270	C	342	A	378	C
284	C	343	C	383	A
288	C	344	B	385	A
292	A	346	A	386	B
293	B	350	B	387	B
296	B	351	A	388	A
297	A	352	B	389	B
298	C	353	A	390	A
299	A	354	C	391	A
302	A	355	C	392	A
303	C	356	A	393	A
304	A	357	A	394	A
305	B	358	A	395	A
306	B	363	A	396	A
312	B	364	A	397	A
316	C	365	A	398	A
321	A	366	A	399	A
326	B	369	A	400	A
328	B	370	A	401	A
329	B	371	B	402	A
330	B	372	A	403	A
331	A	373	A	404	A
332	A	374	A	405	A
333	A	375	A	406	A

- Cont'd -

Table 4 (Cont'd)

407	A	452	A	492	C
409	A	453	A	493	B
420	B	454	A	496	A
421	A	455	A	497	A
424	A	465	A	498	C
428	B	468	A	499	C
429	A	469	A	502	C
431	A	471	A	503	C
432	B	473	C	504	A
433	B	474	C	505	C
434	B	476	B	506	A
436	A	477	A	507	A
437	A	478	A	508	A
438	A	479	B	511	A
439	A	480	A	512	A
440	A	481	A	513	A
441	A	482	A	514	A
442	B	483	B	515	A
444	A	484	A	516	B
445	A	485	A	518	C
446	B	486	A	523	A
447	A	487	A	524	A
448	B	488	A	525	A
449	A	489	A	527	B
450	A	490	A	528	A
451	A	491	B	529	B

- Cont'd -

Table 4 (Cont'd)

531	C	572	A	609	A
532	A	574	B	610	A
533	A	576	A	611	A
534	A	577	A	612	A
535	A	578	C	613	A
536	A	579	B	614	A
537	A	584	B	615	A
538	A	585	B	616	A
541	B	586	A	617	A
544	A	588	C	618	A
546	A	589	A	619	A
548	A	590	A	620	A
551	A	591	A	621	A
553	C	592	A	622	B
554	C	593	A	623	A
555	B	594	A	624	A
556	C	595	A	625	A
557	B	596	C	626	A
562	A	597	C	627	A
563	A	598	C	628	A
565	A	599	B	629	A
566	A	602	A	630	A
567	B	603	A	631	C
568	B	604	A	632	A
569	A	605	A	633	A
570	A	608	A	636	A

- Cont'd -

Table 4 (Cont'd)

637	A	663	A	699	C
638	A	668	A	700	C
639	A	669	A	701	A
640	A	670	A	702	A
641	A	673	B	705	A
642	A	674	A	706	C
643	C	675	A	709	A
644	B	676	A	713	A
645	A	677	A	714	B
646	A	678	A	715	B
647	A	680	A	716	B
648	A	681	A	717	A
649	A	682	A	719	B
650	A	683	A	720	A
651	A	684	A	725	B
652	A	685	A	726	B
653	A	686	A	727	B
654	A	690	B	728	B
655	A	691	A	729	A
656	A	692	A	730	A
657	A	693	A	731	B
658	A	694	A	732	A
659	A	695	A	733	A
660	A	696	A	737	C
661	A	697	A	739	B
662	A	698	A	740	B

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Table 4 (Cont'd)

741	A	780	A	836	A
742	A	782	B	837	B
746	A	783	A	838	C
751	A	784	A	839	C
752	A	787	B	840	C
754	B	789	B	841	C
755	A	804	A	842	A
756	A	812	A	843	A
757	A	813	A	844	A
758	A	814	A	845	B
759	A	815	C	848	A
761	C	817	C	849	A
763	C	820	C	850	A
764	A	821	A	851	A
765	B	822	A	852	A
766	A	823	A	853	A
767	A	824	A	854	A
768	A	825	A	855	A
769	A	826	B		
770	B	827	B		
772	A	828	B		
773	A	829	A		
774	A	831	A		
775	A	833	A		
776	A	834	A		
777	A	835	A		

1 Test example 4 Insecticidal activity against the brown
planthopper (Nilaparvata lugens)

Rice seedlings were dipped into the aqueous emulsion of the compound at 200 ppm for 30 seconds. After 5 air-drying, the seedling were placed in a glass tube, and the 3rd instar nymphs were inoculated on the plants. On 8th day after treatment, the corrected mortality was calculated and the insecticidal activity was judged based on the following criterion.

10 The results are shown in Table 5.

A:	Reviced Mortality	100 - 90%
B:	"	89 - 80%
C:	"	79 - 50%

Table 5

Compound No.	Insecticidal activity	Compound No.	Insecticidal activity	Compound No.	Insecticidal activity
16	A	71	A	123	A
17	A	72	B	124	A
19	A	73	A	125	A
20	A	74	A	133	A
21	A	85	A	134	A
22	A	86	A	135	A
23	A	87	A	136	A
27	A	88	A	140	A
32	A	89	A	154	A
33	A	90	A	155	A
34	A	91	A	157	A
35	A	92	A	158	A
36	A	95	A	159	A
40	C	96	C	160	A
41	A	102	A	161	A
42	A	103	A	166	A
54	A	104	A	193	A
55	A	105	A	194	A
56	B	109	A	195	A
60	A	110	A	198	A
65	C	111	A	199	B
66	A	112	A	200	A
67	A	113	A	203	A
68	A	114	A	204	A
69	A	122	A	211	C

- Con't -

Table 5 (Cont'd)

212	A	283	A	345	A
214	B	302	A	346	C
217	C	303	B	347	A
221	A	304	C	349	A
229	A	305	C	350	A
230	A	306	A	351	A
231	A	310	A	352	A
232	A	311	A	353	A
234	A	314	C	355	A
235	B	315	A	356	A
236	A	316	A	357	A
237	A	321	A	358	A
239	A	328	A	363	A
240	A	329	A	364	A
241	A	330	A	365	A
242	A	331	A	366	A
248	A	332	A	369	A
250	A	333	A	370	A
255	A	334	A	371	A
257	A	336	A	372	A
258	A	337	A	373	A
260	C	339	C	374	A
266	A	340	A	375	A
267	A	342	A	388	A
268	C	343	A	389	A
269	C	344	A	390	A

- Cont'd -

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Table 5 (Cont'd)

391	A	435	B	471	A
392	A	436	A	472	A
394	A	437	A	473	A
395	A	438	A	474	A
396	A	439	A	475	A
397	A	440	A	476	A
398	A	441	B	477	A
399	A	442	A	479	A
400	B	443	A	480	A
401	A	444	B	481	A
402	A	445	C	482	A
403	A	446	B	483	A
404	A	447	A	484	A
405	A	448	A	485	A
406	A	449	A	486	A
407	A	450	A	487	A
409	A	451	A	488	A
421	A	452	A	489	A
422	A	453	A	499	A
424	A	454	A	500	B
427	A	465	A	501	A
428	A	466	A	502	A
429	A	467	A	503	A
431	A	468	A	504	A
433	A	469	A	505	A
434	A	470	A	506	A

- Cont'd -

Table 5 (Cont'd)

507	A	551	A	581	A
508	A	552	A	584	B
516	C	553	A	585	A
517A	A	554	A	586	A
518	A	555	A	587	A
523	A	556	A	588	B
524	A	557	A	589	B
525	A	562	A	594	B
527	A	563	A	595	A
528	A	564	A	602	A
529	A	565	A	603	A
531	A	566	A	604	A
532	A	567	A	608	A
533	A	568	A	609	A
534	A	569	A	610	A
535	A	570	A	611	A
536	A	571	A	612	A
537	A	572	A	613	A
538	A	573	A	614	A
541	A	574	A	615	A
544	A	575	A	616	A
545	A	576	A	617	A
546	A	577	B	618	A
547	A	578	B	619	A
548	A	579	A	620	A
549	A	580	B	621	A

- Cont'd -

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Table 5 (Cont'd)

623	A	655	A	692	A
624	A	656	B	693	A
625	A	657	A	694	B
626	A	658	A	695	B
627	A	659	C	696	A
628	A	660	A	697	A
629	A	661	A	698	A
630	A	662	A	699	A
631	A	663	A	701	A
636	A	668	A	702	A
637	A	669	A	703	C
638	A	670	A	710	C
639	A	671	A	713	A
640	A	672	C	715	A
641	C	673	C	716	A
642	A	674	B	717	A
643	A	675	A	719	A
644	A	677	A	720	C
645	A	679	A	723	B
646	A	680	A	724	A
647	A	682	A	725	A
648	A	683	A	726	A
649	B	684	A	727	A
652	B	685	A	728	A
653	A	686	C	729	A
654	A	691	A	730	C

- Cont'd -

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Table 5 Cont'd)

731	A	769	A	824	A
732	A	770	A	825	A
733	A	772	A	826	A
734	A	774	A	827	A
735	A	775	A	828	A
739	B	776	A	829	A
740	A	790	A	830	A
741	A	791	A	831	A
742	A	792	C	832	A
744	A	793	A	833	A
745	A	794	A	834	A
746	A	795	A	835	A
751	A	799	A	836	A
752	C	801	C	837	C
753	A	812	C	838	A
756	A	813	A	839	A
757	A	814	C	840	A
758	A	815	C	841	A
759	A	816	A	842	A
761	A	817	A	843	A
762	A	818	C	844	A
763	A	819	C	845	A
764	A	820	A	847	B
766	A	821	A	848	A
767	A	822	A	849	A
768	A	823	A	850	A

- Cont'd -

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Table 5 (Cont'd)

851	A	853	A	855	A
852	A	854	A		

1 Test example 5 Insecticidal activity against the
diamondback moth (Plutella xylostella)

Eggs laid on a leaf piece (6 cm x 5 cm) of a
chinese cabbage were dipped into the aqueous emulsion of
5 the compound at 500 ppm for 30 seconds. After air-
drying, the insects and the plant were placed in a petri
dish. On 6th day after treatment, the corrected mortality
was calculated and the insecticidal activity was judged
according to the same criterion as in the test example 4.

10 The results are shown in Table 6.

Table 6

Compound No.	Insecticidal activity	Compound No.	Insecticidal activity	Compound No.	Insecticidal activity
8	A	74	A	133	A
18	C	85	A	136	B
26	A	86	C	142	C
27	C	87	A	154	A
33	A	88	B	155	A
34	A	89	A	156	A
35	A	90	A	157	B
36	B	91	A	158	A
41	A	92	A	159	B
42	A	94	A	160	A
51	C	95	A	169	C
52	A	97	C	192	A
53	B	98	A	193	A
54	B	102	A	195	A
55	B	103	A	196	A
56	A	104	A	197	B
57	C	105	C	198	A
59	A	109	A	199	A
60	A	110	B	200	A
66	A	111	B	201	A
67	A	112	A	202	A
68	A	113	A	203	A
69	A	122	A	204	A
72	A	123	A	205	B
73	A	126	C	206	B

- Con't -

Table 6 (Cont'd)

207	A	251	C	328	A
212	A	252	C	329	A
213	A	253	A	330	A
215	A	254	A	331	B
216	A	255	B	333	A
217	A	256	A	337	A
220	B	257	A	340	A
221	C	262	A	342	A
228	A	263	A	343	A
229	A	264	A	344	A
230	A	265	C	345	B
231	A	266	A	346	A
232	B	267	A	347	A
234	B	268	A	349	A
235	A	269	C	350	A
237	C	280	B	351	A
239	B	281	A	352	A
240	A	283	A	353	A
241	A	284	A	355	A
242	A	300	A	356	A
243	A	302	C	357	A
244	A	303	A	358	A
245	A	312	A	365	A
246	A	316	A	366	A
248	B	321	A	369	A
250	B	324	A	370	B

- Cont'd -

Table 6 (Cont'd)

371	B	407	A	449	A
372	A	409	A	450	A
373	A	420	A	451	A
374	A	421	A	452	A
375	A	424	B	453	A
383	C	425	A	454	A
384	B	427	A	455	A
386	C	428	A	465	A
388	A	429	A	466	A
390	A	431	A	467	A
391	A	432	B	468	A
392	A	433	A	469	A
393	A	434	A	470	A
394	A	435	A	471	A
395	A	436	A	472	A
396	A	437	A	473	A
397	A	438	A	474	A
398	A	439	A	475	A
399	A	440	A	476	A
400	A	441	A	477	A
401	A	442	A	478	A
402	A	444	A	479	A
403	A	445	A	480	A
404	A	446	A	481	A
405	A	447	A	482	A
406	A	448	A	483	A

- Cont'd -

Table 6 (Cont'd)

484	A	524	B	564	A
485	A	525	B	567	A
486	A	527	A	568	A
487	A	531	A	569	A
489	A	532	A	570	A
490	A	533	A	571	A
491	A	534	A	572	A
492	A	535	C	573	A
493	A	536	A	576	A
494	A	537	A	577	A
495	A	538	C	578	A
496	A	544	C	579	A
497	A	545	A	580	B
498	A	546	A	581	A
499	A	547	A	585	C
500	C	548	A	586	B
501	A	549	A	587	C
502	A	551	A	588	C
503	A	552	C	589	B
504	A	553	B	590	C
505	A	554	B	592	B
506	A	555	C	593	C
507	A	556	C	599	C
508	A	557	C	602	A
517	C	562	A	603	A
518	C	563	A	604	A

- Cont'd -

Table 6. (Cont'd)

606	C	636	A	676	A
607	C	638	A	677	A
608	A	639	C	678	A
609	A	640	A	679	A
610	A	641	A	680	A
611	B	642	A	682	A
612	A	643	A	683	A
613	B	648	B	684	A
614	B	649	A	685	A
615	B	650	A	686	B
616	A	651	C	687	C
617	B	653	B	688	C
618	A	657	A	691	C
619	A	658	A	692	B
620	A	659	B	693	A
621	A	660	A	694	A
622	A	661	A	695	A
623	A	662	A	696	B
624	A	663	A	698	C
625	B	667	C	699	C
626	A	668	A	701	A
627	A	670	A	702	A
628	A	671	C	703	C
629	A	673	A	710	C
630	A	674	A	713	A
631	A	675	B	714	A

- Cont'd -

Table 6 (Cont'd)

715	A	760	B	818	A
716	A	761	B	819	A
717	A	762	A	821	A
719	A	763	C	822	A
720	A	764	A	823	A
721	A	766	A	824	A
723	A	767	A	825	A
724	A	768	A	826	A
725	A	769	A	827	A
726	A	770	A	828	A
727	A	772	A	829	A
728	A	773	A	830	A
729	A	774	A	831	A
731	A	775	A	832	B
732	A	776	C	833	A
733	A	777	A	834	A
734	A	780	C	835	A
735	A	784	C	836	A
737	B	786	C	837	A
740	A	795	A	838	A
741	A	799	C	839	A
742	A	802	A	840	B
746	A	805	C	841	A
756	A	812	C	842	A
757	A	815	C	843	A
759	B	817	A	844	A

- Cont'd -

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Table 6 (Cont'd)

845	A	850	A	853	A
847	A	851	A	854	A
848	B	852	A	855	A
849	A				

1 Test example 6 Insecticidal activity against the green
peach aphid (Myzus persicae)

All stages of the aphids were inoculated on a
chinese cabbage. Insects and the plant were sprayed with
5 the aqueous emulsion of the compound at 200 ppm. On 3rd
day after treatment, the insecticidal activity was judged
according to the same criterion as in the test example 4.

The results are shown in Table 7.

Table 7

Compound No.	Insecticidal activity	Compound No.	Insecticidal activity	Compound No.	Insecticidal activity
9	B	54	A	99	A
10	B	55	A	100	B
12	C	56	A	101	A
14	C	57	A	102	B
16	C	58	A	103	A
18	A	59	A	104	A
19	A	60	A	105	C
20	A	66	A	106	A
21	A	67	A	107	C
22	A	68	A	108	C
23	A	69	A	109	A
24	B	71	A	110	A
26	A	72	B	111	A
27	A	73	A	112	A
33	A	74	A	113	A
34	A	77	A	114	C
35	B	85	A	115	A
36	A	86	B	116	A
41	C	87	A	117	A
42	A	88	A	122	B
45	A	89	A	123	C
50	A	90	A	124	C
51	A	91	A	130	A
52	A	92	A	131	A
53	A	95	A	132	A

- Con't -

Table 7 (Cont'd)

133	A	197	A	237	A
134	A	198	A	238	B
135	C	199	A	239	A
136	A	200	A	240	A
138	C	201	A	241	C
139	B	202	A	243	A
140	A	203	A	245	B
141	A	204	A	246	A
143	A	205	A	248	B
145	A	207	C	249	B
153	A	211	A	250	C
154	B	212	A	251	A
155	B	213	A	253	C
156	B	215	A	254	A
157	A	216	B	255	A
158	B	217	C	257	C
159	C	220	A	258	A
160	A	221	A	262	C
161	C	228	C	263	B
163	A	229	A	264	A
173	A	230	A	265	A
180	A	231	A	266	B
193	A	232	A	267	A
194	A	234	A	268	A
195	A	235	A	282	C
196	A	236	A	296	A

- Cont'd -

Table 7 (Cont'd)

299	A	355	A	401	B
302	B	356	A	402	B
306	A	357	A	403	A
311	C	358	A	404	A
315	A	364	B	405	A
316	B	365	A	406	C
321	A	366	A	407	B
328	A	370	B	409	A
329	A	371	B	421	A
330	A	372	C	422	A
331	A	373	B	424	B
332	B	374	B	427	A
333	A	375	A	428	A
334	B	388	B	429	A
337	A	389	A	431	A
340	A	390	A	432	A
342	A	391	A	433	A
343	A	392	A	434	A
344	A	393	B	435	A
345	A	394	A	436	A
346	A	395	A	437	A
347	A	396	A	438	A
349	A	397	A	439	B
350	A	398	B	440	A
352	A	399	B	441	A
353	A	400	A	442	A

- Cont'd -

Table 7 (Cont'd)

443	A	479	A	507	A
444	A	480	A	508	A
445	A	481	A	511	A
446	A	482	A	512	A
447	B	483	A	513	A
448	A	484	A	514	A
449	A	485	A	515	A
450	A	486	A	517	C
451	A	487	A	518	C
452	A	488	A	527	A
453	A	489	A	532	A
454	A	490	A	533	A
455	B	491	A	534	A
465	B	492	A	537	A
466	A	493	A	538	A
467	A	495	A	541	B
468	A	496	B	544	C
469	B	497	A	545	A
470	A	498	A	546	A
471	B	499	A	547	A
472	B	501	A	548	A
473	A	502	A	549	A
474	A	503	A	550	C
476	A	504	A	551	C
477	A	505	A	552	C
478	B	506	A	553	A

- Cont'd -

Table 7 (Cont'd)

554	A	595	A	630	A
555	B	602	A	631	A
556	B	603	A	633	A
557	C	604	B	634	B
561	A	608	A	636	A
562	A	609	A	637	A
563	B	610	A	638	B
564	A	611	C	639	C
565	C	612	A	640	A
566	A	613	A	642	B
567	A	614	B	643	B
568	A	615	B	644	C
569	A	616	C	645	A
570	A	617	A	646	A
571	A	618	B	652	A
572	B	619	A	654	B
573	C	620	A	656	A
574	A	621	B	657	A
576	B	622	B	658	A
577	A	623	C	660	A
578	C	624	A	661	A
580	C	625	A	662	B
584	C	626	A	663	A
585	A	627	A	664	C
586	C	628	A	665	C
588	C	629	A	667	B

- Cont'd -

Table 7 (Cont'd)

668	A	697	A	737	A
669	A	698	C	741	C
670	A	699	A	742	C
671	A	701	A	743	C
673	B	702	A	746	C
674	A	703	C	751.	C
675	B	710	C	752	C
676	B	713	A	757	B
677	A	715	A	758	A
678	A	716	A	759	A
679	A	717	C	762	A
680	A	719	A	763	C
681	C	720	C	764	C
682	A	723	B	766	A
683	A	724	A	767	A
684	B	725	A	768	A
685	C	726	A	769	A
686	A	727	A	770	A
687	B	728	A	772	A
689	B	729	A	774	A
691	B	730	A	775	B
692	A	731	A	776	B
693	A	732	A	777	B
694	A	733	A	779	A
695	A	734	A	798	A
696	A	735	A	799	A

- Cont'd -

Table 7 (Cont'd)

801	C	824	B	840	C
804	C	825	B	841	A
805	C	826	B	842	A
812	A	827	A	843	A
813	B	828	A	844	A
814	B	829	A	848	C
815	B	831	A	849	A
816	C	832	A	850	B
817	C	833	A	851	A
818	C	834	A	852	A
819	C	835	A	853	A
821	A	836	A	854	A
822	A	837	A	855	B
823	A	839	A		

1 Test example 7 Acaricidal activity against the citrus red
mite (Panonychus citri)

Female adults were inoculated on a grapefruit leaf, and were sprayed with the aqueous emulsion of the 5 compound at 200 ppm. On 10th day after treatment, the number of the progeny survived was counted and acaricidal activity was judged according to the same criterion as in the test example 4.

The results are shown in Table 8.

Table 8

Compound No.	Acaricidal activity	Compound No.	Acaricidal activity	Compound No.	Acaricidal activity
8	A	71	A	122	A
9	A	74	A	124	A
10	A	86	A	125	A
11	A	87	A	126	A
12	A	88	A	133	A
13	B	89	A	134	A
24	A	90	A	135	A
25	B	91	A	136	A
27	A	92	A	140	B
32	A	94	B	147	B
33	A	95	A	150	C
34	A	96	A	152	A
35	A	97	A	153	A
41	A	98	A	154	A
42	A	102	A	155	A
50	A	103	A	156	A
51	A	105	A	157	A
53	C	109	A	158	A
54	A	112	A	159	A
55	A	113	A	160	A
56	A	114	A	161	C
57	A	118	A	164	A
65	A	119	B	166	A
68	A	120	B	167	B
69	A	121	A	169	A

- Con't -

Table 8 (Cont'd)

170	A	235	A	269	A
171	A	237	A	282	A
193	A	238	A	283	A
194	A	239	A	284	C
195	B	240	A	300	C
196	C	241	A	329	B
197	A	242	A	330	B
198	A	243	A	333	A
199	A	245	A	334	A
200	A	246	A	335	A
201	A	248	A	337	A
202	A	251	B	342	A
206	A	252	A	343	A
207	C	253	A	344	A
211	A	254	A	347	A
212	A	255	B	349	A
214	A	256	A	350	A
217	A	257	A	351	A
218	A	258	A	353	A
219	A	262	A	354	A
220	A	263	A	355	A
221	C	264	A	356	A
227	A	265	A	357	A
230	A	266	A	358	A
232	A	267	A	363	A
233	B	268	A	364	A

- Cont'd -

Table 8 (Cont'd)

365	A	403	A	465	A
366	A	404	A	466	A
367	A	406	B	467	C
369	A	407	C	468	A
370	A	408	C	469	A
371	A	409	A	470	A
373	A	410	C	471	A
374	A	421	A	472	A
375	B	422	A	473	A
376	B	431	A	476	A
377	B	432	A	477	A
381	A	433	A	478	C
385	A	434	B	479	A
387	A	437	A	480	A
388	A	439	C	481	A
389	A	442	A	482	A
390	A	443	A	483	A
391	A	444	A	484	A
392	A	447	A	485	A
393	A	448	A	486	A
394	A	449	A	487	A
397	C	450	A	488	A
399	A	451	A	489	A
400	B	452	A	516	A
401	A	453	A	517	A
402	A	455	A	518	A

- Cont'd -

Table 8 (Cont'd)

523	A	563	A	595	A
524	A	564	A	596	B
525	A	565	A	597	A
527	A	566	A	598	B
529	A	567	A	599	B
532	A	568	A	602	B
533	A	569	A	603	C
534	A	570	A	604	A
535	B	571	A	605	B
537	A	572	A	606	A
538	A	573	B	607	A
541	B	574	A	608	A
543	C	575	A	609	A
544	A	576	A	610	A
545	A	577	A	611	A
546	A	578	A	612	A
547	B	579	B	613	A
548	A	580	A	614	A
549	A	584	A	615	A
552	A	585	A	616	A
553	A	586	A	617	A
554	A	587	A	618	A
555	A	588	A	619	B
556	A	589	C	620	A
557	A	592	C	621	A
562	A	594	A	623	A

- Cont'd -

Table 8 (Cont'd)

624	A	654	B	682	A
625	A	655	B	683	A
626	A	656	B	684	A
627	A	657	C	685	B
628	A	658	A	686	B
629	A	659	A	688	C
630	A	660	A	690	A
631	A	661	A	691	A
636	A	662	A	692	A
637	A	663	A	693	A
638	A	664	A	694	A
639	A	665	A	695	A
640	A	666	A	696	A
641	A	667	A	697	A
642	A	668	A	698	A
643	A	669	A	699	A
644	B	670	A	700	A
645	A	671	A	701	A
646	A	672	A	702	C
647	A	673	A	703	A
648	A	674	A	705	A
649	A	675	A	710	A
650	B	677	A	711	C
651	A	678	A	712	A
652	A	680	A	713	A
653	A	681	A	714	A

- Cont'd -

Table 8 (Cont'd)

715	A	750	C	812	A
716	A	751	A	813	A
717	A	754	A	815	A
719	A	755	A	816	A
720	A	756	A	817	A
725	A	757	A	818	A
726	A	758	B	819	A
727	C	759	A	821	A
728	A	760	A	822	A
729	A	761	A	823	A
730	A	763	B	824	B
731	A	764	C	825	A
732	A	766	A	826	A
733	A	767	A	827	A
734	A	768	A	828	A
735	A	769	A	829	A
737	A	772	B	830	A
739	A	773	C	831	B
740	A	774	A	832	B
741	A	775	A	834	C
742	A	777	A	835	A
743	A	778	B	836	A
744	A	795	A	839	B
745	A	800	A	840	C
746	A	801	B	842	A
749	A	802	A	843	B

- Cont'd -

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Table 8 (Cont'd)

845	A	851	A	854	B
848	A	852	A	856	B
850	A	853	A	857	B

- 1 Test example 8 Acaricidal activity against the twospotted spidermite (Tetranychus urticae)

All stages of the mites were inoculated on a soybean plant. The mites and the plant were sprayed with
5 the aqueous emulsion of the compound at 200 ppm. On 8th day after treatment, the acaricidal activity was judged according to the same criterion as in the test example 4.

The results are shown in table 9.

Table 9

Compound No.	Acaricidal activity	Compound No.	Acaricidal activity	Compound No.	Acaricidal activity
8	A	52	A	92	A
9	A	53	A	93	A
10	A	54	A	94	A
11	A	55	A	95	A
12	A	56	A	96	A
13	A	57	A	97	A
17	C	58	A	98	A
19	A	59	A	102	A
20	A	60	A	103	A
21	A	65	B	104	A
22	A	66	A	105	A
23	A	67	A	109	A
24	A	68	A	110	A
25	A	69	A	111	A
27	A	71	A	112	A
32	B	72	A	113	A
33	A	73	A	114	A
34	A	74	A	118	A
35	A	85	A	119	A
36	A	86	A	120	A
40	A	87	A	121	A
41	B	88	A	122	A
42	A	89	A	123	A
50	A	90	A	124	A
51	B	91	A	125	A

- Con't -

Table 9 (Cont'd)

126	A	159	A	214	A
127	A	160	A	215	A
133	A	161	C	217	A
134	A	164	A	219	A
135	A	166	A	220	A
136	A	167	A	221	A
138	A	169	A	228	A
139	A	170	A	229	A
140	A	171	A	230	A
141	A	193	A	231	A
142	C	194	A	232	B
143	A	195	A	233	A
144	C	197	B	234	A
145	A	198	A	235	A
146	A	199	A	236	A
147	A	200	A	237	A
149	C	201	A	238	A
150	C	202	A	239	A
151	C	203	A	240	A
152	B	204	A	241	A
153	A	205	A	242	A
154	A	206	A	243	A
155	A	207	A	244	A
156	A	211	A	245	A
157	A	212	A	246	A
158	A	213	B	248	A

- Cont'd -

Table 9 (Cont'd)

249	A	334	A	377	C
250	A	335	B	378	C
251	A	337	C	379	C
253	A	342	B	382	A
254	A	343	C	383	A
255	A	344	B	384	A
256	A	350	C	385	B
257	A	353	A	386	A
258	A	354	A	387	A
262	A	355	A	388	A
263	A	356	A	389	A
264	A	357	A	390	A
265	A	358	B	391	A
266	A	363	A	392	A
267	A	364	A	393	A
268	A	365	A	394	A
269	A	366	A	395	A
281	B	367	B	396	B
282	A	369	A	397	B
283	A	370	B	399	A
302	B	371	A	400	A
304	C	372	A	401	A
328	C	373	A	402	A
331	C	374	A	403	A
332	C	375	A	404	A
333	A	376	B	405	A

- Cont'd -

Table 9 (Cont'd)

406	A	451	A	487	A
407	A	452	A	488	A
409	A	453	A	489	A
421	A	454	A	490	A
422	A	455	A	491	A
424	B	465	A	492	A
427	B	466	A	493	A
428	B	467	A	494	A
431	B	468	A	495	A
432	B	469	A	496	A
433	C	470	A	497	A
434	C	471	A	498	A
436	A	472	A	499	A
437	C	473	A	500	A
438	A	474	A	501	A
439	A	476	A	502	A
440	B	477	A	503	A
441	A	478	C	504	A
443	A	479	A	505	A
444	A	480	A	506	A
445	A	481	A	507	A
446	A	482	A	508	C
447	C	483	A	516	C
448	A	484	A	517	A
449	A	485	A	518	A
450	A	486	A	523	A

- Cont'd -

Table 9 (Cont'd)

524	A	558	A	594	A
525	A	559	B	595	A
527	A	561	A	596	C
531	A	562	A	597	B
532	A	563	A	599	B
533	A	564	A	600	B
534	A	565	B	602	A
535	A	566	B	603	A
536	A	567	A	604	A
537	A	568	A	605	A
538	A	569	A	606	A
541	A	570	A	607	B
544	A	571	A	608	A
545	A	572	A	609	A
546	A	573	A	610	A
547	A	574	A	611	A
548	A	575	B	612	A
549	A	576	A	613	A
550	B	577	A	614	A
551	A	578	A	615	A
552	A	579	A	616	A
553	A	580	A	617	A
554	A	584	A	618	A
555	A	585	A	619	A
556	A	587	A	620	A
557	A	588	A	621	A

- Cont'd -

Table 9 (Cont'd)

623	A	656	A	684	A
624	A	657	A	691	A
625	A	658	A	692	A
626	A	659	A	694	A
627	A	660	A	695	C
628	A	661	A	696	A
629	A	662	A	697	A
630	A	663	A	699	A
631	A	664	A	701	A
636	A	665	A	702	A
637	A	666	A	703	A
638	A	667	A	704	B
639	A	668	A	705	A
640	A	669	A	706	A
642	A	670	A	709	A
643	A	671	A	710	A
644	C	672	A	712	A
645	A	673	A	713	A
646	A	674	A	714	B
647	A	675	A	715	A
648	A	677	A	716	A
650	C	678	A	717	A
652	A	680	A	718	C
653	B	681	A	719	A
654	A	682	A	720	A
655	A	683	A	721	A

- Cont'd -

Table 9 (Cont'd)

723	A	756	B	785	B
724	A	757	A	789	C
725	A	758	A	791	C
726	A	759	A	792	B
727	A	760	A	799	B
728	A	761	A	800	B
729	A	762	B	801	B
730	A	763	A	804	A
731	A	764	B	811	C
732	A	765	C	816	A
733	A	766	A	817	A
734	A	767	A	818	A
735	B	768	A	819	A
736	C	769	A	821	A
737	A	770	A	822	A
739	A	771	A	823	A
740	A	772	A	824	A
741	A	773	A	825	B
742	A	774	A	826	A
743	A	775	A	827	A
745	B	776	A	828	A
746	A	777	A	829	A
751	A	778	A	830	A
752	A	779	A	831	A
753	A	780	A	832	A
754	B	782	A	833	A

- Cont'd -

Table 9 (Cont'd)

834	A	840	A	850	A
835	A	842	A	851	A
836	A	843	A	852	A
837	A	844	A	853	A
838	B	845	C	854	A
839	A	848	A	855	A

1 Next, formulation examples will be shown. In the
examples, all parts are by weight.

Formulation example 1 Wettable powder

	Compound No.60	50 parts
5	Mixture of diatomaceous earth and clay	45 parts
	Polyoxyethylene nonylphenyl ether	5 parts

The above materials were uniformly mixed and
ground to obtain a wettable powder.

Formulation example 2 Emulsion

10	Compound No.154	20 parts
	Tetrahydrofuran	20 parts
	Xylene	45 parts
	Mixture of polyoxyethylene nonylphenyl ether and a salt of alkylbenzenesulfonic	
15	acid	15 parts

The above materials were uniformly mixed and
dissolved to obtain an emulsion.

Formulation example 3 Dust

	Compound No.503	4 parts
20	Mixture of diatomaceous earth, clay and talc	95 parts
	Calcium stearate	1 part

The above materials were univormly mixed and
ground to obtain a dust.

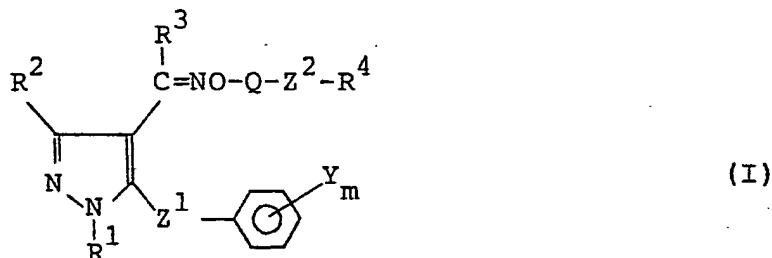
1 Formulation example 4 Granule

Compound No.237	3 parts
Mixture of bentonite and clay	92 parts
Calcium ligninsulfonate	5 parts

5 The above materials were uniformly mixed and ground. The resulting ground mixture were thoroughly kneaded with a proper amount of water and pelletized to obtain granules.

What is claimed is:

1. A pyrazole oxime derivative represented by the general formula (I),



wherein R^1 represents C_1-C_4 alkyl or phenyl; R^2 represents hydrogen, C_1-C_5 alkyl, C_1-C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; R^4 represents hydrogen, C_2-C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of

the formula, — [in which X represents hydrogen;

halogen; C_1-C_{12} alkyl; C_1-C_6 alkyl substituted with halogen, cyano, hydroxy, C_1-C_5 alkoxy or C_2-C_6 alkoxy-carbonyl; C_3-C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_2-C_4 alkenyl substituted with halogen, hydroxy, C_2-C_4 alkoxy carbonyl or C_2-C_6 alkylcarbonyl; phenyl; hydroxy; C_1-C_6 alkoxy; C_1-C_4 alkoxy substituted with halogen or C_2-C_6 alkoxy carbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylendioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1-C_3 haloalkyl; a substituent of

the formula, $-S(O)_pR^5$ (in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOR^6$ (in which R^6 represents hydrogen; alkali metal; C_1-C_{10} alkyl; C_1-C_5 alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxycarbonyl or phenoxy-phenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a

substituent of the formula, $-S_n^7R^8R^9$ (in which R^7 , R^8 and

R^9 , which may be the same or different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl); C_2-C_6 alkylcarbonyl; C_2-C_6 alkylcarbonyl substituted with cyano or C_2-C_6 alkoxy-carbonyl; benzoyl which may or may not be substituted with halogen or C_1-C_6 alkyl; C_2-C_6 alkylthiocarbonyl; C_3-C_7 alkoxycarbonylcarbonyl; a substituent of the formula,

$\begin{array}{c} O \\ \parallel \\ -CN \\ | \\ R^{10} \\ | \\ R^{11} \end{array}$ (in which R^{10} and R^{11} , which may be the same or

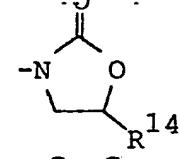
different, represent hydrogen, C_1-C_6 alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C_1-C_4 alkyls; a substituent

of the formula, $\begin{array}{c} R^{12} \\ | \\ -N \\ | \\ R^{13} \end{array}$ (in which R^{12} represents hydrogen

or C_1-C_5 alkyl, and R^{13} represents formyl, C_2-C_{12} alkoxy-carbonyl, or C_2-C_5 alkoxycarbonyl substituted with halogen

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or C₁-C₄ alkoxy); a substituent of the formula,



(in which R¹⁴ represents hydrogen, C₁-C₄ alkyl or C₂-C₆

alkoxyalkyl); a substituent of the formula, -C(R¹⁷)₂BR¹⁵BR¹⁶

(in which R¹⁵ and R¹⁶, which may be the same or different, represent C₁-C₄ alkyl or, taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxy carbonyl, and B represents oxygen or sulfur); a sub-

stituent of the formula, -C(R¹⁹)₂OR¹⁸ (in which R¹⁸ represents

hydrogen or C₂-C₄ alkyl carbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or C₁-C₆

alkyl); a substituent of the formula, -Si(R²¹)₂R²²R²³ (in which

R²¹, R²² and R²³, which may be the same or different, represent C₁-C₄ alkyl); or a substituent of the formula,

-O-Si(R²⁴)₂R²⁵R²⁶ (in which R²⁴, R²⁵ and R²⁶, which may be the

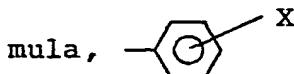
same or different, represent C₁-C₄ alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C₁-C₆ alkyl, C₁-C₄ haloalkyl, halogen, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₃ alkyl enedioxy,

phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $-S(O)_q R^{27}$ (in which R^{27} represents C_1-C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2-C_5 alkoxy carbonyl or a

substituent of the formula, $-N \begin{array}{c} R^{28} \\ | \\ R^{29} \end{array}$ (in which R^{28} and R^{29} ,

which may be the same or different, represent hydrogen, C_1-C_4 alkyl, or benzyl which may or may not be substituted with C_2-C_6 alkoxy carbonyl); z^1 represents oxygen or sulfur; z^2 represents oxygen, sulfur or single bond; Q represents C_1-C_8 alkylene, C_1-C_8 alkylene substituted with halogen or phenyl, C_3-C_{12} alkenylene, C_3-C_{12} haloalkenylene or C_3-C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different.

2. A pyrazole oxime derivative according to Claim 1, wherein R^1 represents C_1-C_4 alkyl; R^2 represents C_1-C_4 alkyl or C_1-C_3 haloalkyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; R^4 represents a substituent of the for-

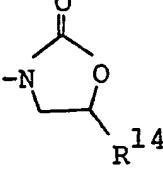
mula,  [in which X represents C_1-C_{12} alkyl; C_1-C_4

haloalkyl; C_3-C_7 cycloalkyl; C_3-C_7 cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_1-C_5 alkoxy; C_1-C_4 haloalkoxy; 3-chloro-5-trifluoromethylpyridin-2-yloxy; a substituent of the formula, $-S(O)_p R^5$ (in which R^5

represents C_1-C_5 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); a substituent of the formula, $-COOR^6$ (in which R^6 represents C_1-C_8 alkyl, C_1-C_6 haloalkyl, C_5-C_7 cycloalkyl; or C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl); C_2-C_6 alkylcarbonyl; C_2-C_6 alkylthiocarbonyl; C_3-C_9 N,N -dialkylcarbonyl; a substituent of

the formula, $\begin{array}{c} R^{12} \\ | \\ -N \\ | \\ R^{13} \end{array}$ (in which R^{12} represents C_1-C_5 alkyl,

and R^{13} represents C_2-C_{10} alkoxy carbonyl or formyl); a sub-

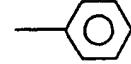
stituent of the formula,  (in which R^{14} repre-

sents hydrogen, C_1-C_4 alkyl or C_2-C_5 alkoxyalkyl); a sub-

stituent of the formula, $\begin{array}{c} BR^{15} \\ | \\ -C \\ | \\ R^{17} \\ | \\ BR^{16} \end{array}$ (in which R^{15} and R^{16} ,

taken together, form C_1-C_7 alkylene, R^{17} represents C_1-C_4 alkyl and B represents oxygen or sulfur); or trimethylsilyl]; Y represents hydrogen, C_1-C_6 alkyl, halogen, C_1-C_4 alkoxy or C_1-C_4 haloalkoxy; and Q represents C_1-C_4 alkylene which may have a branched chain.

3. A pyrazole oxime derivative according to Claim 1, wherein R^1 represents methyl; R^2 represents methyl or trifluoromethyl; R^3 represents hydrogen or methyl; R^4 repre-

sents a substituent of the formula,  [in which X

represents tert-butyl, 2,2-dichloro-1-methylcyclopropyl, 1-cyanocyclopentyl, cyclohexyl, tert-butoxy, 1,1,2,2-tetrafluoroethoxy, 3-chloro-5-trifluoromethylpyridin-2-yloxy, C_1-C_4 alkylthio, heptafluoropropylthio, C_1-C_3 haloalkylsulfinyl, tert-butylcarbonyl, tert-butylthiocarbonyl, C_3-C_7 N,N -dialkylcarbamoyl, 2-methyl-1,3-dioxolane-2-yl, 2,4-dimethyl-1,3-dioxolane-2-yl, 2-isopropyl-1,3-dioxolane-2-yl, 2-isopropyl-1,3-dithiolane-2-yl, a substituent of the formula, $-COOR^6$ (in which R^6 represents C_3-C_5 alkyl, 1,1-dimethyl-2-chloroethyl, cyclohexyl or 1-methylcyclohexyl),

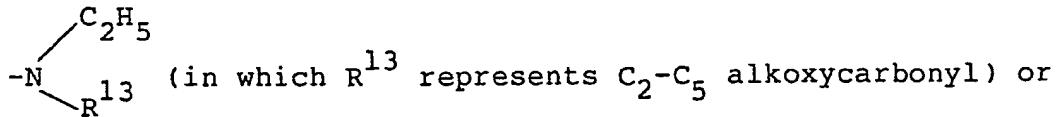
a substituent of the formula, $\begin{array}{c} C_2H_5 \\ | \\ -N \\ | \\ R^{13} \end{array}$ (in which R^{13}

represents C_2-C_9 alkoxy carbonyl or 2-chloroethoxycarbonyl), 5-ethyl-1,3-oxazolidone-2-yl or trimethylsilyl; Y represents hydrogen or fluorine; Z^1 represents oxygen; Z^2 represents oxygen or single bond; and Q represents C_1-C_3 alkylene which may have a branched chain.

4. A pyrazole oxime derivative according to claim 1, wherein R^1 represents methyl; R^2 represents methyl or trifluoromethyl; R^3 represents hydrogen; R^4 represents a substituent of the formula, $\begin{array}{c} \text{C}_6\text{H}_5 \\ | \\ -X \end{array}$ [in which X represents

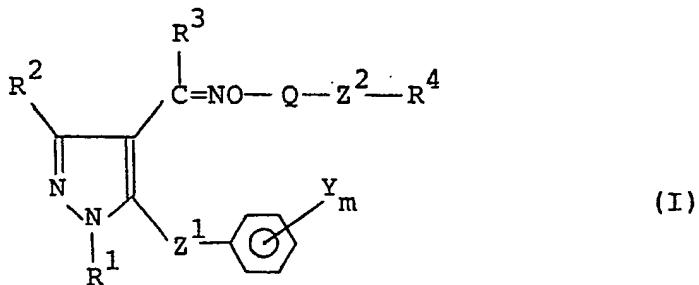
tert-butyl, 2,2-dichloro-1-methylcyclopropyl, 1-cyano-cyclopentyl, tert-butoxy, 1,1,2,2-tetrafluoroethoxy, heptafluoropropylthio, C_1-C_3 haloalkylsulfinyl, tert-butylcarbonyl, C_3-C_7 N,N -dialkylcarbamoyl,

2-isopropyl-1,3-dioxolane-2-yl, 2-isopropyl-1,3-dithiolane-2-yl, a substituent of the formula, $-\text{COOR}^6$ (in which R^6 represents $\text{C}_3\text{-C}_5$ alkyl, 1,1-dimethyl-2-chloroethyl, cyclohexyl or 1-methylcyclohexyl), a substituent of the formula,



5-ethyl-1,3-oxazolidone-2-yl]; Y represents hydrogen or fluorine; Z^1 represents oxygen; Z^2 represents oxygen or single bond; Q represents $\text{C}_1\text{-C}_2$ alkylene which may have a branched chain; and m represents an integer of 1.

5. A method for producing a pyrazole oxime derivative represented by the general formula (I),



wherein R^1 represents $\text{C}_1\text{-C}_4$ alkyl or phenyl; R^2 represents hydrogen, $\text{C}_1\text{-C}_5$ alkyl, $\text{C}_1\text{-C}_3$ haloalkyl or phenyl; R^3 represents hydrogen, $\text{C}_1\text{-C}_4$ alkyl or phenyl; R^4 represents hydrogen, $\text{C}_2\text{-C}_4$ alkylcarbonyl, benzoyl, naphthyl or a substituent of

the formula, $\text{--}\bigcirc\text{---}^{\text{X}}\text{n}$ [in which X represents hydrogen;

halogen; $\text{C}_1\text{-C}_{12}$ alkyl, $\text{C}_1\text{-C}_6$ alkyl substituted with halogen, cyano, hydroxy, $\text{C}_1\text{-C}_5$ alkoxy or $\text{C}_2\text{-C}_6$ alkoxy carbonyl;

C_3-C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_2-C_4 alkenyl substituted with halogen, hydroxy, C_2-C_4 alkoxy carbonyl or C_2-C_6 alkyl carbonyl; phenyl; hydroxy; C_1-C_6 alkoxy; C_1-C_4 alkoxy substituted with halogen or C_2-C_6 alkoxy carbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylene dioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1-C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOP^6$ (in which R^6 represents hydrogen; alkali metal; C_1-C_{10} alkyl; C_1-C_5 alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxy carbonyl or phenoxyphenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a substituent of

$\begin{array}{c} R^7 \\ \backslash \\ -S_n \backslash R^8 \\ / \quad \backslash \\ R^9 \end{array}$

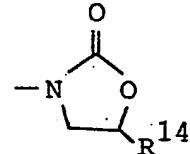
the formula, $-S_n^{R^7}R^8R^9$ (in which R^7 , R^8 and R^9 , which may be

the same or different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl); C_2-C_6 alkyl carbonyl; C_2-C_6 alkyl carbonyl substituted with cyano or C_2-C_6 alkoxy carbonyl; benzoyl which may or may not be substituted with halogen or C_1-C_6 alkyl; C_2-C_6 alkyl thiocarbonyl; C_3-C_7 alkoxy carbonyl-

carbonyl; a substituent of the formula, $\begin{array}{c} O \\ || \\ -CN \backslash R^{10} \\ / \quad \backslash \\ R^{11} \end{array}$ (in

which R¹⁰ and R¹¹, which may be the same or different, represent hydrogen, C₁-C₆ alkyl or phenyl; piperidino-carbonyl; morpholinocarbonyl which may or may not be substituted with one or two C₁-C₄ alkyls; a substituent of the

formula, $\begin{array}{c} \text{R}^{12} \\ | \\ -\text{N}-\text{R}^{13} \end{array}$ (in which R¹² represents hydrogen or C₁-C₅ alkyl, and R¹³ represents formyl, C₂-C₁₂ alkoxy-carbonyl, or C₂-C₅ alkoxycarbonyl substituted with halogen

or C₁-C₄ alkoxy); a substituent of the formula, 

(in which R¹⁴ represents hydrogen, C₁-C₄ alkyl or C₂-C₆

alkoxyalkyl); a substituent of the formula, $\begin{array}{c} \text{BR}^{15} \\ | \\ -\text{C}-\text{R}^{17} \\ | \\ \text{BR}^{16} \end{array}$ (in

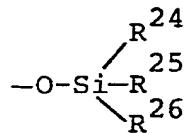
which R¹⁵ and R¹⁶, which may be the same or different, represent C₁-C₄ alkyl or, taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxycarbonyl, and B represents oxygen or sulfur); a

substituent of the formula, $\begin{array}{c} \text{OR}^{18} \\ | \\ -\text{C}-\text{R}^{19} \\ | \\ \text{R}^{20} \end{array}$ (in which R¹⁸ repre-

sents hydrogen or C₂-C₄ alkylcarbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or

C₁-C₆ alkyl); a substituent of the formula, $\begin{array}{c} \text{R}^{21} \\ | \\ -\text{Si}-\text{R}^{22} \\ | \\ \text{R}^{23} \end{array}$ (in

which R^{21} , R^{22} and R^{23} , which may be the same or different, represent C_1-C_4 alkyl); or a substituent of the formula,

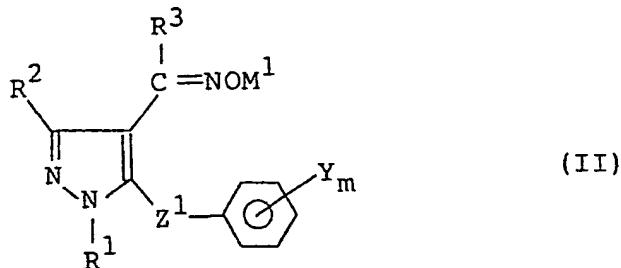


(in which R^{24} , R^{25} and R^{26} , which may be the

same or different, represent C_1-C_4 alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C_1-C_6 alkyl, C_1-C_4 haloalkyl, halogen, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_3 alkyl-enedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $-S(O)_q R^{27}$ (in which R^{27} represents C_1-C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2-C_5 alkoxy-

carbonyl or a substituent of the formula, $\begin{array}{c} R^{28} \\ \diagdown \\ -N \\ \diagup \\ R^{29} \end{array}$ (in

which R^{28} and R^{29} , which may be the same or different, represent hydrogen, C_1-C_4 alkyl, or benzyl which may or may not be substituted with C_2-C_6 alkoxy carbonyl); z^1 represents oxygen or sulfur; z^2 represents oxygen, sulfur or single bond; Q represents C_1-C_8 alkylene, C_1-C_8 alkylene substituted with halogen or phenyl, C_3-C_{12} alkenylene, C_3-C_{12} haloalkenylene or C_3-C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different, which comprises reacting a compound represented by the general formula (II),

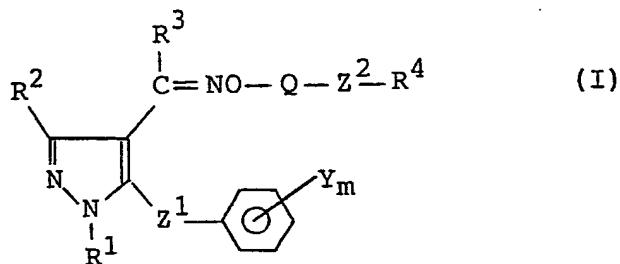


wherein R^1 , R^2 , R^3 , Y , Z^1 and m are as defined above, and M^1 represents hydrogen or alkali metal,
with a compound represented by the general formula (III),



wherein R^4 , Q and Z^2 are as defined above, and Hal represents halogen.

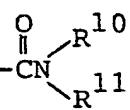
6. A method for producing a pyrazole oxime derivative represented by the general formula (I),



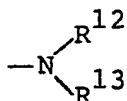
wherein R^1 represents C_1-C_4 alkyl or phenyl; R^2 represents hydrogen, C_1-C_5 alkyl, C_1-C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; R^4 represents hydrogen, C_2-C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of

the formula, [in which X represents hydrogen;

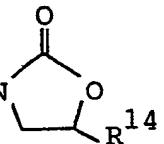
halogen; C_1-C_{12} alkyl; C_1-C_6 alkyl substituted with halogen, cyano, hydroxy, C_1-C_5 alkoxy or C_2-C_6 alkoxycarbonyl; C_3-C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_2-C_4 alkenyl substituted with halogen, hydroxy, C_2-C_4 alkoxycarbonyl or C_2-C_6 alkylcarbonyl; phenyl; hydroxy; C_1-C_6 alkoxy; C_1-C_4 alkoxy substituted with halogen or C_2-C_6 alkoxycarbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylenedioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen of C_1-C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOR^6$ (in which R^6 represents hydrogen; alkali metal; C_1-C_{10} alkyl; C_1-C_5 alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxycarbonyl or phenoxyphenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a substituent of the formula, $-S_n^R^7R^8R^9$ (in which R^7 , R^8 and R^9 , which may be the same or different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl); C_2-C_6 alkylcarbonyl; C_2-C_6 alkylcarbonyl substituted with cyano or C_2-C_6 alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C_1-C_6 alkyl; C_2-C_6 alkylthiocarbonyl; C_3-C_7 alkoxycarbonylcarbonyl; a

substituent of the formula,  (in which R¹⁰ and

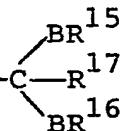
R¹¹, which may be the same or different, represent hydrogen, C₁-C₆ alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C₁-C₄ alkyls; a substituent of the formula,

 (in which R¹² represents hydrogen or C₁-C₅ alkyl,

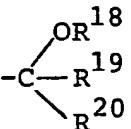
and R¹³ represents formyl, C₂-C₁₂ alkoxy carbonyl, or C₂-C₅ alkoxy carbonyl substituted with halogen or C₁-C₄ alkoxy); a

substituent of the formula,  (in which R¹⁴

represents hydrogen, C₁-C₄ alkyl or C₂-C₆ alkoxyalkyl); a

substituent of the formula,  (in which R¹⁵ and

R¹⁶, which may be the same or different, represent C₁-C₄ alkyl or, taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxy carbonyl, and B represents oxygen or sulfur); a substituent of the

formula,  (in which R¹⁸ represents hydrogen or

C₂-C₄ alkyl carbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or C₁-C₆ alkyl); a

substituent of the formula, $\text{--Si} \begin{array}{c} \text{R}^{21} \\ | \\ \text{R}^{22} \\ | \\ \text{R}^{23} \end{array}$ (in which R^{21} , R^{22}

and R^{23} , which may be the same or different, represent

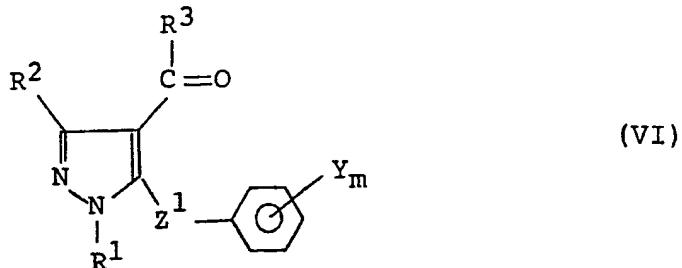
$\text{C}_1\text{-C}_4$ alkyl); or a substituent of the formula, $\text{--O-Si} \begin{array}{c} \text{R}^{24} \\ | \\ \text{R}^{25} \\ | \\ \text{R}^{26} \end{array}$

(in which R^{24} , R^{25} and R^{26} , which may be the same or different, represent $\text{C}_1\text{-C}_4$ alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, $\text{C}_1\text{-C}_6$ alkyl, $\text{C}_1\text{-C}_4$ haloalkyl, halogen, hydroxy, $\text{C}_1\text{-C}_4$ alkoxy, $\text{C}_1\text{-C}_4$ haloalkoxy, $\text{C}_1\text{-C}_3$ alkylenedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $\text{--S(O)}_q \text{R}^{27}$ (in which R^{27} represents $\text{C}_1\text{-C}_3$ alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, $\text{C}_2\text{-C}_5$ alkoxy-

carbonyl or a substituent of the formula, $\text{--N} \begin{array}{c} \text{R}^{28} \\ | \\ \text{R}^{29} \end{array}$ (in

which R^{28} and R^{29} , which may be the same or different, represent hydrogen, $\text{C}_1\text{-C}_4$ alkyl, or benzyl which may or may not be substituted with $\text{C}_2\text{-C}_6$ alkoxy carbonyl); z^1 represents oxygen or sulfur; z^2 represents oxygen, sulfur or single bond; Q represents $\text{C}_1\text{-C}_8$ alkylene, $\text{C}_1\text{-C}_8$ alkylene substituted with halogen or phenyl, $\text{C}_3\text{-C}_{12}$ alkenylene, $\text{C}_3\text{-C}_{12}$ haloalkenylene or $\text{C}_3\text{-C}_6$ alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different,

which comprises reacting a compound represented by the general formula (VI),

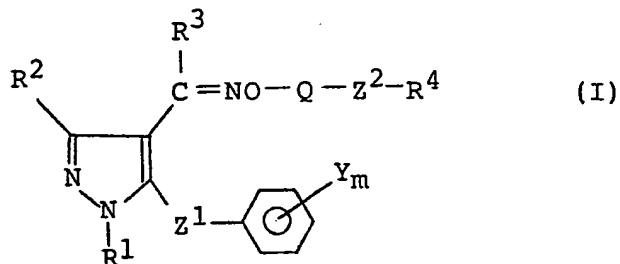


wherein R^1 , R^2 , R^3 , Y , Z^1 and m are as defined above, with a compound represented by the general formula (VII),



wherein R^4 , Q and Z^2 are as defined above.

7. A method for producing a pyrazole oxime derivative represented by the general formula (I),



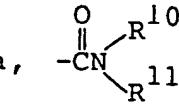
wherein R^1 represents C_1-C_4 alkyl or phenyl; R^2 represents hydrogen, C_1-C_5 alkyl, C_1-C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; R^4 represents hydrogen, C_2-C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of

the formula, [in which X represents hydrogen;

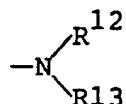
halogen; C_1-C_{12} alkyl; C_1-C_6 alkyl substituted with halogen, cyano, hydroxy, C_1-C_5 alkoxy or C_2-C_6 alkoxycarbonyl; C_3-C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_2-C_4 alkenyl substituted with halogen, hydroxy, C_2-C_4 alkoxycarbonyl or C_2-C_6 alkylcarbonyl; phenyl; hydroxy; C_1-C_6 alkoxy; C_1-C_4 alkoxy substituted with halogen or C_2-C_6 alkoxycarbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylenedioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1-C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOR^6$ (in which R^6 represents hydrogen; alkali metal; C_1-C_{10} alkyl; C_1-C_5 alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxycarbonyl or phenoxyphenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; C_3-C_8 cycloalkyl, C_3-C_8 cycloalkyl substituted with C_1-C_3 alkyl; phenyl; or a substituent of the

formula, $-S\begin{array}{c} R^7 \\ | \\ n \backslash R^8 \\ | \\ R^9 \end{array}$ (in which R^7 , R^8 and R^9 , which may be

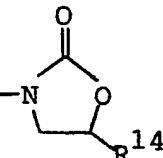
the same or different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl); C_2-C_6 alkylcarbonyl; C_2-C_6 alkylcarbonyl substituted with cyano or C_2-C_6 alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C_1-C_6 alkyl; C_2-C_6 alkylthiocarbonyl; C_3-C_7 alkoxycarbonylcarbonyl; a

substituent of the formula,  (in which R¹⁰ and

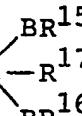
R¹¹, which may be the same or different, represent hydrogen, C₁-C₆ alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C₁-C₄ alkyls; a substituent of the formula,

 (in which R¹² represents hydrogen or C₁-C₅ alkyl,

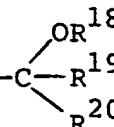
and R¹³ represents formyl, C₂-C₁₂ alkoxy carbonyl, or C₂-C₅ alkoxy carbonyl substituted with halogen or C₁-C₄ alkoxy); a

substituent of the formula,  (in which R¹⁴

represents hydrogen, C₁-C₄ alkyl or C₂-C₆ alkoxyalkyl); a

substituent of the formula,  (in which R¹⁵ and

R¹⁶, which may be the same or different, represent C₁-C₄ alkyl or, taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxy carbonyl, and B represents oxygen or sulfur); a substituent of the

formula,  (in which R¹⁸ represents hydrogen or

C₂-C₄ alkyl carbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or C₁-C₆ alkyl); a

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substituent of the formula, -Si₂₁²¹₂₂²²₂₃²³ (in which R²¹, R²²

and R²³, which may be the same or different, represent

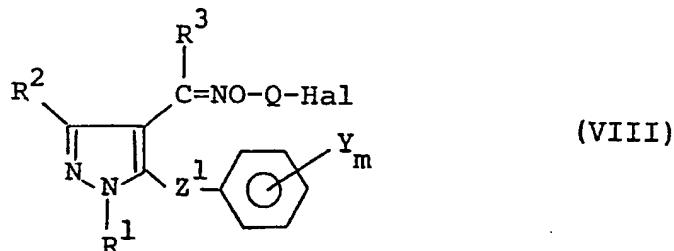
C₁-C₄ alkyl); or a substituent of the formula, -O-Si₂₄²⁴₂₅²⁵₂₆²⁶

(in which R²⁴, R²⁵ and R²⁶, which may be the same or different, represent C₁-C₄ alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C₁-C₆ alkyl, C₁-C₄ haloalkyl, halogen, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₃ alkylenedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, -S(O)_qR²⁷ (in which R²⁷ represents C₁-C₃ alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C₂-C₅ alkoxy-

carbonyl or a substituent of the formula, -N₂₈²⁸₂₉²⁹ (in

which R²⁸ and R²⁹, which may be the same or different, represent hydrogen, C₁-C₄ alkyl, or benzyl which may or may not be substituted with C₂-C₆ alkoxy carbonyl), z¹ represents oxygen or sulfur; z² represents oxygen, sulfur or single bond; Q represents C₁-C₈ alkylene, C₁-C₈ alkylene substituted with halogen or phenyl, C₃-C₁₂ alkenylene, C₃-C₁₂ haloalkenylene or C₃-C₆ alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different,

which comprises reacting a compound represented by the general formula (VIII),



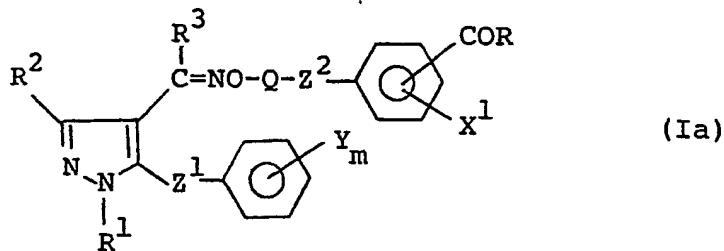
wherein R^1 , R^2 , R^3 , Y , Q , Z^1 and m are as defined above, and Hal represents halogen,

with a compound represented by the general formula (IX),



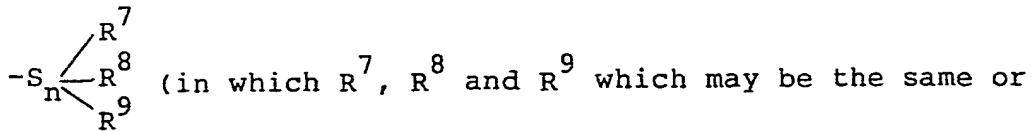
wherein R^4 and Z^2 are as defined above, and M^2 represents hydrogen or alkali metal.

8. A method for producing a pyrazole oxime derivative represented by the general formula (Ia),



wherein R represents a substituent of the formula, -OW {in which W represents alkali metal; C_1-C_{10} alkyl; alkyl substituted with halogen, C_1-C_4 alkoxy, phenoxy, C_2-C_4 alkoxy carbonyl or phenoxyphenyl; C_2-C_7 alkenyl; C_3-C_7 alkynyl; C_3-C_8 cycloalkyl; C_3-C_8 cycloalkyl substituted

with C_1-C_3 alkyl; phenyl; or a substituent of the formula,

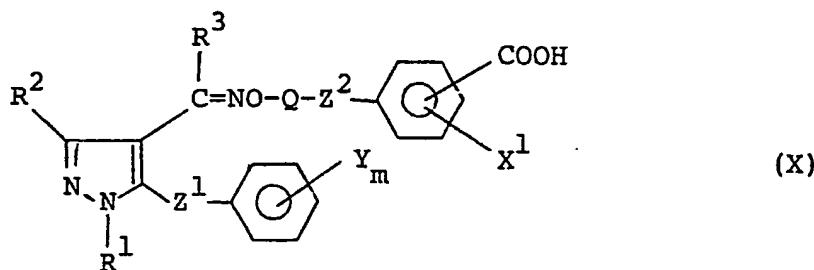


different, represent C_1-C_4 alkyl or C_3-C_8 cycloalkyl}, a substituent of the formula, $-\text{N}^{\text{R}^{10}}_{\text{R}^{11}}$ (in which R^{10} and R^{11} , which may be the same or different, represent hydrogen, C_1-C_6 alkyl or phenyl); piperidino; morpholino which may or may not be substituted with one or two C_1-C_4 alkyls; or C_2-C_6 alkylthio; R^1 represents C_1-C_4 alkyl or phenyl; R^2 represents hydrogen, C_1-C_5 alkyl, C_1-C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; Y represents hydrogen, C_1-C_6 alkyl, C_1-C_4 haloalkyl, halogen, hydroxy, C_1-C_4 alkoxy, C_1-C_4 haloalkoxy, C_1-C_3 alkyl-enedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, $-\text{S}(\text{O})_q^{\text{R}^{27}}$ (in which R^{27} represents C_1-C_3 alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2-C_5 alkoxy-

carbonyl or a substituent of the formula, $-\text{N}^{\text{R}^{28}}_{\text{R}^{29}}$ (in

which R^{28} and R^{29} , which may be the same or different, represent hydrogen, C_1-C_4 alkyl, or benzyl which may or may not be substituted with C_2-C_6 alkoxy carbonyl); Z^1 represents oxygen or sulfur; Z^2 represents oxygen, sulfur or single bond; Q represents C_1-C_8 alkylene, C_1-C_8 alkylene substituted with halogen or phenyl, C_3-C_{12} alkenylene,

C_3-C_{12} haloalkenlene or C_3-C_6 alkynylene; m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different; and X^1 represents hydrogen or C_1-C_4 alkyl,
which comprises reacting a compound represented by the general formula (X),



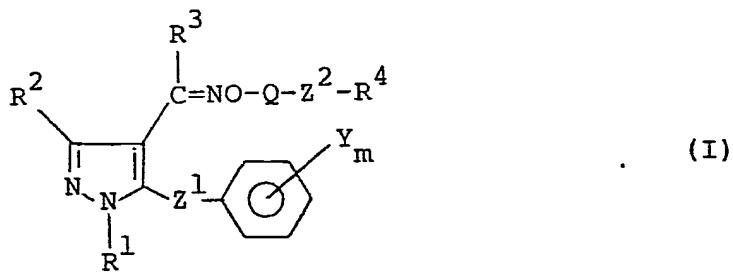
wherein R^1 , R^2 , R^3 , X^1 , Y , Z^1 , Z^2 , Q and m are as defined above, with a compound represented by the general formula (XI),

RH

(XI)

wherein R is as defined above.

9. An insecticidal and acaricidal composition for use in agriculture and horticulture comprising an insecticidally and/or acaricidally effective amount of a pyrazole oxime derivative as an active ingredient and a suitable carrier, said pyrazole oxime derivative being represented by the general formula (I),



wherein R^1 represents C_1-C_4 alkyl or phenyl; R^2 represents hydrogen, C_1-C_5 alkyl, C_1-C_3 haloalkyl or phenyl; R^3 represents hydrogen, C_1-C_4 alkyl or phenyl; R^4 represents hydrogen, C_2-C_4 alkylcarbonyl, benzoyl, naphthyl or a substituent of

the formula, [in which X represents hydrogen;

halogen; C_1-C_{12} alkyl; C_1-C_6 alkyl substituted with halogen, cyano, hydroxy, C_1-C_5 alkoxy or C_2-C_6 alkoxy carbonyl; C_3-C_8 cycloalkyl; cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_4 alkyl, halogen and cyano; C_2-C_4 alkenyl substituted with halogen, hydroxy, C_2-C_4 alkoxy carbonyl or C_2-C_6 alkyl carbonyl; phenyl; hydroxy; C_1-C_6 alkoxy; C_1-C_4 alkoxy substituted with halogen or C_2-C_6 alkoxy carbonyl; phenoxy which may or may not be substituted with C_1-C_3 haloalkyl; benzyloxy; C_1-C_3 alkylene dioxy formed by two adjacent Xs; pyridyloxy which may or may not be substituted with halogen or C_1-C_3 haloalkyl; a substituent of the formula, $-S(O)_pR^5$
(in which R^5 represents C_1-C_6 alkyl, C_1-C_5 haloalkyl or phenyl, and p represents an integer of 0, 1 or 2); cyano; formyl; nitro; a substituent of the formula, $-COOR^6$ (in

which R⁶ represents hydrogen; alkali metal; C₁-C₁₀ alkyl, C₁-C₅ alkyl substituted with halogen, C₁-C₄ alkoxy, phenoxy, C₂-C₄ alkoxycarbonyl or phenoxyphenyl; C₂-C₇ alkenyl; C₃-C₇ alkynyl; C₃-C₈ cycloalkyl; C₃-C₈ cycloalkyl substituted with C₁-C₃ alkyl; phenyl; or a substituent of

the formula, $-S\begin{array}{c} R^7 \\ | \\ n \\ | \\ R^8 \\ | \\ R^9 \end{array}$ (in which R⁷, R⁸ and R⁹, which may be

the same or different, represent C₁-C₄ alkyl or C₃-C₈ cycloalkyl); C₂-C₆ alkylcarbonyl; C₂-C₆ alkylcarbonyl substituted with cyano or C₂-C₆ alkoxycarbonyl; benzoyl which may or may not be substituted with halogen or C₁-C₆ alkyl; C₂-C₆ alkylthiocarbonyl; C₃-C₇ alkoxycarbonyl-

carbonyl; a substituent of the formula, $-CN\begin{array}{c} O \\ || \\ R^{10} \\ | \\ R^{11} \end{array}$ (in which

R¹⁰ and R¹¹, which may be the same or different, represent hydrogen, C₁-C₆ alkyl or phenyl); piperidinocarbonyl; morpholinocarbonyl which may or may not be substituted with one or two C₁-C₄ alkyls; a substituent of the formula,

$-N\begin{array}{c} R^{12} \\ | \\ R^{13} \end{array}$ (in which R¹² represents hydrogen or C₁-C₅ alkyl,

and R¹³ represents formyl, C₂-C₁₂ alkoxycarbonyl, or C₂-C₅ alkoxycarbonyl substituted with halogen or C₁-C₄ alkoxy); a

substituent of the formula, $-N\begin{array}{c} O \\ || \\ O \\ | \\ R^{14} \end{array}$ (in which R¹⁴

represents hydrogen, C₁-C₄ alkyl or C₂-C₆ alkoxyalkyl; a

substituent of the formula, -C(R¹⁷)¹⁵BR¹⁶ (in which R¹⁵ and R¹⁶,

which may be the same or different, represent C₁-C₄ alkyl or, taken together, may form C₁-C₄ alkylene, R¹⁷ represents C₁-C₅ alkyl, cyano or C₂-C₆ alkoxy carbonyl, and B represents oxygen or sulfur); a substituent of the formula,

-C(R¹⁹)¹⁸R²⁰ (in which R¹⁸ represents hydrogen or C₂-C₄

alkyl carbonyl, and R¹⁹ and R²⁰, which may be the same or different, represent hydrogen or C₁-C₆ alkyl); a sub-

stituent of the formula, -Si(R²¹)²²R²³ (in which R²¹, R²² and

R²³, which may be the same or different, represent C₁-C₄

alkyl); or a substituent of the formula, -O-Si(R²⁴)²⁵R²⁶ (in

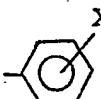
which R²⁴, R²⁵ and R²⁶, which may be the same or different, represent C₁-C₄ alkyl), and n represents an integer of from 1 to 5, and when n represents an integer of from 2 to 5, X may be the same or different]; Y represents hydrogen, C₁-C₆ alkyl, C₁-C₄ haloalkyl, halogen, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₃ alkylenedioxy, phenoxy which may or may not be substituted with trifluoromethyl, a substituent of the formula, -S(O)_qR²⁷ (in which R²⁷ represents C₁-C₃

alkyl and q represents an integer of 0, 1 or 2), hydroxycarbonyl, C_2-C_5 alkoxy carbonyl or a substituent of the

formula, $-N\begin{array}{c} R^{28} \\ | \\ R^{29} \end{array}$ (in which R^{28} and R^{29} , which may be the

same or different, represent hydrogen, C_1-C_4 alkyl, or benzyl which may or may not be substituted with C_2-C_6 alkoxy carbonyl); Z^1 represents oxygen or sulfur; Z^2 represents oxygen, sulfur or single bond; Q represents C_1-C_8 alkylene, C_1-C_8 alkylene substituted with halogen or phenyl, C_3-C_{12} alkenylene, C_3-C_{12} haloalkenylene or C_3-C_6 alkynylene; and m represents an integer of from 1 to 3, and when m represents an integer of 2 or 3, Y may be the same or different.

10. An insecticidal and acaricidal composition for use in agriculture and horticulture according to Claim 9, wherein R^1 represents C_1-C_4 alkyl; R^2 represents C_1-C_4 alkyl or C_1-C_3 haloalkyl; R^3 represents hydrogen or C_1-C_4

alkyl; R^4 represents a substituent of the formula, $-X$


[in which X represents C_1-C_{12} alkyl, C_1-C_4 haloalkyl, C_5-C_7 cycloalkyl; C_3-C_7 cycloalkyl substituted with from one to three members selected from the group consisting of C_1-C_3 alkyl, halogen and cyano; C_3-C_4 alkoxy; C_1-C_2 haloalkoxy; 3-chloro-5-trifluoromethylpyridin-2-yloxy; a substituent of the formula, $-S(O)_pR^5$ (in which R^5 represents C_2-C_4 alkyl, C_1-C_3 haloalkyl or phenyl, and p represents an integer of

0, 1 or 2); a substituent of the formula, $-COOR^6$ (in which R^6 represents C_3-C_7 alkyl; C_4-C_6 haloalkyl; C_5-C_6 cycloalkyl; or C_5-C_6 cycloalkyl substituted with C_1-C_3 alkyl);

C_2-C_6 alkylcarbonyl; C_2-C_6 alkylthiocarbonyl; C_3-C_9 N,N-

dialkylcarbamoyl; a substituent of the formula, $-N\begin{array}{c} R^{12} \\ | \\ R^{13} \end{array}$

(in which R^{12} represents C_1-C_5 alkyl and R^{13} represents C_2-C_{10} alkoxy carbonyl or formyl); 1,3-dioxolane-2-yl substituted with C_1-C_4 alkyl; 1,3-dithiolane-2-yl substituted with C_1-C_4 alkyl; or trimethylsilyl]; Y represents hydrogen, halogen, C_1-C_4 alkoxy or C_1-C_4 haloalkoxy; and Q represents C_1-C_4 alkylene.

11. An insecticidal and acaricidal composition for use in agriculture and horticulture according to Claim 9, wherein R^1 represents methyl; R^2 represents methyl or trifluoromethyl; R^3 represents hydrogen or methyl; R^4

represents a substituent of the formula, $\text{--}\text{C}_6\text{H}_4\text{--}X$ [in

which X represents tert-butyl, 2,2-dichloro-1-methylcyclopropyl, 1-cyanocyclopentyl, cyclohexyl, tert-butoxy, 1,1,2,2-tetrafluoroethoxy, 3-chloro-5-trifluoromethyl-pyridin-2-yloxy, tert-butylthio, heptafluoropropylthio, heptafluoropropylsulfinyl, 1,1,2,2-tetrafluoroethyl-sulfinyl, a substituent of the formula, $-COOR^6$ (in which R^6 represents C_3-C_5 alkyl, 1,1-dimethyl-2-chloroethyl, cyclohexyl or 1-methylcyclohexyl), tert-butylcarbonyl,

tert-butylthiocarbonyl, N,N-diisopropylcarbamoyl, a

substituent of the formula, $-\text{N} \begin{array}{c} \text{C}_2\text{H}_5 \\ \diagdown \\ \text{R}^{13} \end{array}$ (in which R^{13} repre-

sents $\text{C}_4\text{-C}_9$ alkoxy carbonyl or 2-chloroethoxy carbonyl), 2-isopropyl-1,3-dioxolane-2-yl, 2-isopropyl-1,3-dithiolane-2-yl or trimethylsilyl]; Y represents hydrogen or fluorine; Z^1 represents oxygen; Z^2 represents oxygen or single bond; Q represents $\text{C}_1\text{-C}_2$ alkylene which may have a branched chain; and m represents an integer of 1.

12. An insecticidal and acaricidal composition for use in agriculture and horticulture according to Claim 9, wherein R^1 represents methyl; R^2 represents methyl or trifluoromethyl; R^3 represents hydrogen; R^4 represents a

substituent of the formula, $-\text{C}_6\text{H}_4\text{-X}$ [in which X repre-

sents tert-butyl, 2,2-dichloro-1-methylcyclopropyl, 1-cyanocyclopentyl, tert-butoxy, 1,1,2,2-tetrafluoroethoxy, heptafluoropropylthio, heptafluoropropylsulfinyl, a substituent of the formula, $-\text{COOR}^6$ (in which R^6 represents $\text{C}_3\text{-C}_5$ alkyl, 1,1-dimethyl-2-chloroethyl, cyclohexyl or 1-methylcyclohexyl), tert-butylcarbonyl, N,N-diisopropyl-

carbamoyl, a substituent of the formula, $-\text{N} \begin{array}{c} \text{C}_2\text{H}_5 \\ \diagdown \\ \text{R}^{13} \end{array}$ (in

which R^{13} represents $\text{C}_4\text{-C}_8$ alkoxy carbonyl), 2-isopropyl-1,3-dioxolane-2-yl, 2-isopropyl-1,3-dithiolane-2-yl or

trimethylsilyl]; Y represents hydrogen or fluorine; z^1 represents oxygen; z^2 represents oxygen or single bond; Q represents C_1-C_2 alkylene which may have a branched chain; and m represents an integer of 1.